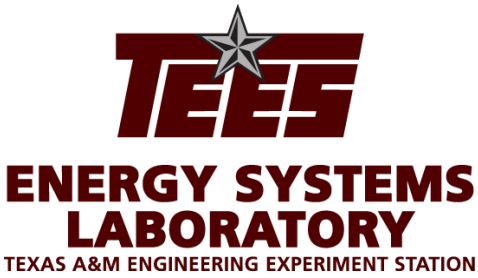
ESL-TR-17-12-02



TAMU Project

Energy Consumption Data Quality Assurance/Quality Control Assessment Report for the

Month of November 2017

Prepared for

Utility & Energy Services

Division of Administration

Texas A&M University

December 2017

Acknowledgements

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Executive Summary

This report analyzes the energy use data collected from 611 meters in 206 buildings and complexes (approximately 20,468,000 GSF) on the campus of Texas A&M University in College Station, Texas. The report consists of five sections: 1) The summary of the monthly energy consumption per meter ID, 2) The quality control and assurance analysis of incorrect or incomplete energy use patterns, 3) Energy consumption time series plots, 4) Energy Balance plots, and 5) Energy Balance plots with filled-in consumption data. Section one contains the summary of monthly energy consumption for each of the TAMU buildings. Section two includes the reviews on each of those building energy use patterns that presented problems in the metered data. Section three and four are a collection of the plots generated for the energy use analysis, as reference to indicate and validate the quality of the metered energy data. The Section five includes the energy balance plots with filled-in energy data.

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I.Summary of Monthly Consumption

Table I-1 November 2017 Monthly Consumption for TAMU Buildings

TAMU#	Building Name	Area (ft^2)	MeterID	Type	Monthly Consumption	Units	Comments
0270	Emerging Technologies Building	305,316	007469	ELE	176,525	kWh	
0270	Emerging Technologies Building	305,316	007470	ELE	45,652	kWh	
0270	Emerging Technologies Building	305,316	007471	CHW	1,251,215	mBtu	
0270	Emerging Technologies Building	305,316	007475	HHW	315,140	mBtu	
0275	Liberal Arts and Arts & Humanities Building	107,500	007715	ELE	50,587	kWh	
0275	Liberal Arts and Arts & Humanities Building	107,500	007716	CHW	203,954	mBtu	
0275	Liberal Arts and Arts & Humanities Building	107,500	007717	HHW	35,489	mBtu	
0290	Wells Residence Hall	67,283	006870	ELE	44,896	kWh	
0290	Wells Residence Hall	67,283	001984	CHW	774,756	mBtu	
0290	Wells Residence Hall	67,283	001988	HHW	552,822	mBtu	
0291	Rudder Residence Hall	67,283	000351	ELE	45,311	kWh	
0291	Rudder Residence Hall	67,283	002132	CHW	375,523	mBtu	(2)
0291	Rudder Residence Hall	67,283	002136	HHW	198,368	mBtu	(2)
0292	Eppright Residence Hall	67,283	000002	ELE	50,474	kWh	
0292	Eppright Residence Hall	67,283	002262	CHW	325,929	mBtu	
0292	Eppright Residence Hall	67,283	002266	HHW	178,258	mBtu	
0293	Appelt Residence Hall	82,767	000003	ELE	60,567	kWh	
0293	Appelt Residence Hall	82,767	002062	CHW	698,079	mBtu	#, (1), (2)
0293	Appelt Residence Hall	82,767	002066	HHW	329,269	mBtu	#, (1), (2)
0294	Lechner Residence Hall	59,541	000004	ELE	48,535	kWh	
0294	Lechner Residence Hall	59,541	002285	CHW	616,509	mBtu	
0294	Lechner Residence Hall	59,541	002289	HHW	512,278	mBtu	
0296-0297	Mitchell Inst. For Fundamental Phys & Astronomy	189,617	006536	ELE	121,091	kWh	
0296-0297	Mitchell Inst. For Fundamental Phys & Astronomy	189,617	006537	ELE	120,928	kWh	
0296-0297	Mitchell Inst. For Fundamental Phys & Astronomy	189,617	006534	CHW	1,011,710	mBtu	
0296-0297	Mitchell Inst. For Fundamental Phys & Astronomy	189,617	006535	HHW	240,360	mBtu	
0353	Bright Aerospace Building	148,837	001569	ELE	166,369	kWh	
0353	Bright Aerospace Building	148,837	002746	CHW	1,030,630	mBtu	(2)
0353	Bright Aerospace Building	148,837	002757	HHW	81,505	mBtu	(2)
0358	Davis Football Player Development Center	20,026	007699	ELE	29,649	kWh	
0358	Davis Football Player Development Center	20,026	007701	CHW	135,960	mBtu	
0358	Davis Football Player Development Center	20,026	007702	HHW	12,361	mBtu	
0361	Bright Football Complex	124,971	008461	ELE	218,399	kWh	
0361	Bright Football Complex	124,971	002547	CHW	972,459	mBtu	
0361	Bright Football Complex	124,971	002551	HHW	202,929	mBtu	
0367	Kyle Field	489,000	000336	ELE	157,971	kWh	
0367	Kyle Field	489,000	008861	ELE	119,157	kWh	
0367	Kyle Field	489,000	008862	ELE	101,627	kWh	*
0367	Kyle Field	489,000	008863	ELE	214,519	kWh	
0367	Kyle Field	489,000	008864	ELE	222,667	kWh	
0367	Kyle Field	489,000	008865	ELE	69,272	kWh	
0367	Kyle Field	489,000	008866	ELE	145,005	kWh	
0367	Kyle Field	489,000	008867	ELE	232,702	kWh	
0367	Kyle Field	489,000	008868	ELE	115,728	kWh	
0367	Kyle Field	489,000	008852	CHW	2,209,972	mBtu	
0367	Kyle Field	489,000	008026	CHW	2,389,795	mBtu	
0367	Kyle Field	489,000	008856	HHW	332,993	mBtu	
0367	Kyle Field	489,000	008027	HHW	1,263,804	mBtu	#, (1)
0376	Chemistry Building Addition	115,797	006229	ELE	157,137	kWh	
0376	Chemistry Building Addition	115,797	006230	ELE	105,903	kWh	
0376	Chemistry Building Addition	115,797	007115	CHW	1,800,294	mBtu	
0376	Chemistry Building Addition	115,797	007119	HHW	1,128,198	mBtu	
0383	Koldus Building	110,272	001488	ELE	162,223	kWh	
0383	Koldus Building	110,272	002863	CHW	584,763	mBtu	
0383	Koldus Building	110,272	002874	HHW	140,969	mBtu	
0384	Sanders Corps of Cadets Center	19,363	001554	ELE	24,207	kWh	
0384	Sanders Corps of Cadets Center	19,363	002583	CHW	170,348	mBtu	
0384	Sanders Corps of Cadets Center	19,363	002587	HHW	104,026	mBtu	
0325-0385	CE TTI Office & Lab Building	157,844	009122	ELE	155,649	kWh	
0325-0385	CE TTI Office & Lab Building	157,844	009123	CHW	576,356	mBtu	*
0325-0385	CE TTI Office & Lab Building	157,844	009124	HHW	246,742	mBtu	*
0386	Jack E. Brown Chemical Engineering Building	205,000	001428	ELE	145,529	kWh	
0386	Jack E. Brown Chemical Engineering Building	205,000	001429	ELE	321,472	kWh	
0386	Jack E. Brown Chemical Engineering Building	205,000	002250	CHW	2,207,341	mBtu	#, (1)
0386	Jack E. Brown Chemical Engineering Building	205,000	006871	CHW	115,473	mBtu	
0386	Jack E. Brown Chemical Engineering Building	205,000	002254	HHW	539,099	mBtu	(1)
0387	Richardson Petroleum Engineering Building	113,700	005870	ELE	79,917	kWh	
0387	Richardson Petroleum Engineering Building	113,700	005872	ELE	99,283	kWh	*
0387	Richardson Petroleum Engineering Building	113,700	005805	CHW	824,804	mBtu	
0387	Richardson Petroleum Engineering Building	113,700	005809	HHW	282,689	mBtu	
0391-0392	James J. Cain'51 and Mechanical Engineering Office Building	173,481	001573	ELE	195,806	kWh	
0391-0392	James J. Cain'51 and Mechanical Engineering Office Building	173,481	002906	CHW	1,145,624	mBtu	
0391-0392	James J. Cain'51 and Mechanical Engineering Office Building	173,481	002910	HHW	289,912	mBtu	

Table I-1 November 2017 Monthly Consumption for TAMU Buildings (*Continued*)

TAMU#	Building Name	Area (ft^2)	MeterID	Type	Monthly Consumption	Units	Comments
0394	Underwood Residence Hall	81,730	000014	ELE	61,452	kWh	
0394	Underwood Residence Hall	81,730	002117	CHW	373,867	mBtu	(2)
0394	Underwood Residence Hall	81,730	002121	HHW	130,801	mBtu	(2)
0398	Langford Architecture Center Building A	116,619	003806	ELE	124,713	kWh	
0398	Langford Architecture Center Building A	116,619	003951	CHW	541,693	mBtu	(2)
0398	Langford Architecture Center Building A	116,619	003955	HHW	184,161	mBtu	(2)
0400-0402-1405	Spence Hall, Briggs Hall, and Ash II LLC	108,555	009386	ELE	87,154	kWh	
0400	Spence Hall Dorm 1	38,907	009290	ELE	13,426	kWh	
0400	Spence Hall Dorm 1	38,907	009291	ELE	16,323	kWh	
0400-1405	Spence Hall and Ash II LLC	72,038	009292	CHW	381,936	mBtu	
0400-1405	Spence Hall and Ash II LLC	72,038	009296	HHW	147,275	mBtu	
1405	Ash II LLC	33,131	009387	CHW	153,218	mBtu	
1405	Ash II LLC	33,131	009391	HHW	35,041	mBtu	
0402	Briggs Hall Dorm 3	36,517	009322	ELE	16,936	kWh	
0402	Briggs Hall Dorm 3	36,517	009323	ELE	12,582	kWh	
0402	Briggs Hall Dorm 3	36,517	009324	CHW	244,816	mBtu	
0402	Briggs Hall Dorm 3	36,517	009328	HHW	84,180	mBtu	
0401-0403-1404	Kiest Hall, Fountain Hall, and Plank LLC	108,752	009370	ELE	86,560	kWh	
0401	Kiest Hall Dorm 2	38,815	009306	ELE	13,227	kWh	
0401	Kiest Hall Dorm 2	38,815	009307	ELE	13,345	kWh	
0401-1404	Kiest Hall, and Plank LLC	72,052	009308	CHW	470,211	mBtu	
0401-1404	Kiest Hall, and Plank LLC	72,052	009312	HHW	197,851	mBtu	
1404	Plank LLC	33,237	009372	CHW	236,075	mBtu	
1404	Plank LLC	33,237	009376	HHW	51,502	mBtu	
0403	Fountain Hall Dorm 4	36,700	009338	ELE	13,845	kWh	
0403	Fountain Hall Dorm 4	36,700	009339	ELE	13,836	kWh	
0403	Fountain Hall Dorm 4	36,700	009340	CHW	238,085	mBtu	
0403	Fountain Hall Dorm 5	36,700	009344	HHW	93,373	mBtu	
0404-0406-1403	Gainer Hall, Leonard Hall and Ash LLC	90,072	009401	ELE	70,298	kWh	
0406-1403	Leonard Hall - Dorm 7 and Ash LLC	53,508	007982	CHW	300,021	mBtu	
0406-1403	Leonard Hall - Dorm 7 and Ash LLC	53,508	007983	HHW	96,382	mBtu	
0406	Leonard Hall - Dorm 7	36,222	008011	ELE	13,876	kWh	
0406	Leonard Hall - Dorm 7	36,222	008012	ELE	14,154	kWh	
1403	H. Grady Ash, Jr. '58 Leadership Learning Center	17,286	008005	CHW	69,584	mBtu	
1403	H. Grady Ash, Jr. '58 Leadership Learning Center	17,286	008006	HHW	6,253	mBtu	
0404	Gainer Hall Dorm 5	36,564	009354	ELE	12,806	kWh	
0404	Gainer Hall Dorm 5	36,564	009355	ELE	12,401	kWh	
0404	Gainer Hall Dorm 5	36,564	009356	CHW	233,280	mBtu	
0404	Gainer Hall Dorm 5	36,564	009360	HHW	89,726	mBtu	#, (1)
0405-0407-1402	Lacy Hall - Dorm 6, Harrell Hall and Leadership Learning Center	91,310	007721	ELE	78,154	kWh	
0407-1402	Harrell Hall - Dorm 8 and Buzbee LLC	54,443	007722	CHW	344,714	mBtu	
0407-1402	Harrell Hall - Dorm 8 and Buzbee LLC	54,443	007723	HHW	96,392	mBtu	
0405	Lacy Hall - Dorm 6	36,867	007922	ELE	28,823	kWh	
0405	Lacy Hall - Dorm 6	36,867	007918	CHW	237,449	mBtu	
0405	Lacy Hall - Dorm 6	36,867	007919	HHW	96,301	mBtu	
0407	Harrell Hall - Dorm 8	36,943	007729	ELE	30,594	kWh	
1402	Buzbee Leadership Learning Center	17,500	007725	CHW	150,711	mBtu	
1402	Buzbee Leadership Learning Center	17,500	007726	HHW	9,817	mBtu	
0408	Whitely Hall - Dorm 9	36,893	010031	ELE	30,731	kWh	
0408	Whitely Hall - Dorm 9	36,893	010035	CHW	232,038	mBtu	
0408	Whitely Hall - Dorm 9	36,893	010036	HHW	85,466	mBtu	
0409	White Hall - Dorm 10	36,893	010032	ELE	31,210	kWh	
0409	White Hall - Dorm 10	36,893	010039	CHW	257,216	mBtu	
0409	White Hall - Dorm 10	36,893	010040	HHW	106,646	mBtu	
0410	Harrington Hall - Dorm 11	36,893	010033	ELE	29,917	kWh	
0410	Harrington Hall - Dorm 11	36,893	010043	CHW	234,365	mBtu	
0410	Harrington Hall - Dorm 11	36,893	010044	HHW	85,576	mBtu	
0411	Utay Hall - Dorm 12	36,943	010034	ELE	30,955	kWh	
0411	Utay Hall - Dorm 12	36,943	010047	CHW	251,742	mBtu	
0411	Utay Hall - Dorm 12	36,943	010048	HHW	102,622	mBtu	
0412	Moses Residence Hall	40,828	000027	ELE	40,183	kWh	
0412	Moses Residence Hall	40,828	002384	CHW	503,570	mBtu	
0412	Moses Residence Hall	40,828	002395	HHW	194,761	mBtu	
0415	Davis-Gary Residence Hall	40,828	000030	ELE	34,573	kWh	
0415	Davis-Gary Residence Hall	40,828	002532	CHW	362,903	mBtu	
0415	Davis-Gary Residence Hall	40,828	002543	HHW	227,663	mBtu	
0419	Legett Residence Hall	45,134	000031	ELE	14,797	kWh	
0419	Legett Residence Hall	45,134	002218	CHW	238,270	mBtu	(2)
0419	Legett Residence Hall	45,134	002222	HHW	102,125	mBtu	(2)
0420	Milner Hall	48,268	009144	ELE	25,941	kWh	
0420	Milner Hall	48,268	009145	CHW	113,015	mBtu	
0420	Milner Hall	48,268	009146	HHW	59,804	mBtu	
0422	Walton Residence Hall	51,494	000378	ELE	64,133	kWh	
0422	Walton Residence Hall	51,494	002364	HHW	44,242	mBtu	

Table I-1 November 2017 Monthly Consumption for TAMU Buildings (*Continued*)

TAMU#	Building Name	Area (ft^2)	MeterID	Type	Monthly Consumption	Units	Comments
0424	Hotard Hall	18,500	000032	ELE	13,295	kWh	
0424	Hotard Hall	18,500	002657	CHW	110,511	mBtu	
0424	Hotard Hall	18,500	002668	HHW	73,735	mBtu	
0425	Henderson Hall	22,185	001553	ELE	15,175	kWh	
0425	Henderson Hall	22,185	002607	CHW	150,669	mBtu	
0425	Henderson Hall	22,185	002611	HHW	88,132	mBtu	
0426-0427-0428	FHK Complex	154,349	000331	ELE	118,306	kWh	
0426-0427-0428	FHK Complex	154,349	002848	CHW	860,329	mBtu	(2)
0426-0427-0428	FHK Complex	154,349	002859	HHW	542,929	mBtu	
0430	Schumacher Residence Hall	38,957	000034	ELE	32,415	kWh	
0430	Schumacher Residence Hall	38,957	002015	CHW	283,233	mBtu	
0430	Schumacher Residence Hall	38,957	002030	HHW	146,884	mBtu	
0359	Architecture Building B	28,545	005518	ELE	21,581	kWh	
0432	Architecture Building C	73,020	005584	ELE	83,791	kWh	
0359-0432	Architecture Building B&C	101,565	006419	CHW	575,883	mBtu	
0359-0432	Architecture Building B&C	101,565	006423	HHW	259,782	mBtu	
0434	Luedecke Building (Cyclotron)	80,646	005555	ELE	150,849	kWh	
0434	Luedecke Building (Cyclotron)	80,646	005558	ELE	987,039	kWh	
0434	Luedecke Building (Cyclotron)	80,646	006664	CHW	1,631,275	mBtu	
0434	Luedecke Building (Cyclotron)	80,646	006668	HHW	193,221	mBtu	
0435	Harrington Education Center Office Tower	130,844	001546	ELE	106,772	kWh	
0435	Harrington Education Center Office Tower	130,844	002792	CHW	540,340	mBtu	
0435	Harrington Education Center Office Tower	130,844	002796	HHW	430,463	mBtu	# (1)
0436	Reed-McDonald Building	77,435	006868	ELE	94,144	kWh	
0436	Reed-McDonald Building	77,435	002419	CHW	846,758	mBtu	
0436	Reed-McDonald Building	77,435	002423	HHW	408,976	mBtu	
0438	Harrington Education Center Classroom Building	61,860	003630	ELE	38,554	kWh	
0438	Harrington Education Center Classroom Building	61,860	002784	CHW	169,402	mBtu	
0438	Harrington Education Center Classroom Building	61,860	002788	HHW	139	mBtu	
0433-0440-0441-0442-0447	Mosher Commons Krueger Dunn Aston	577,584	009099	ELE	308,205	kWh	
0433	Mosher Residence Hall	155,430	009083	ELE	102,239	kWh	
0433	Mosher Residence Hall	155,430	002485	CHW	473,529	mBtu	(2)
0433	Mosher Residence Hall	155,430	002489	HHW	257,307	mBtu	(2)
0440-0441	Commons Krueger	196,633	009833	ELE	172,164	kWh	
0440	Commons Hall	84,500	009237	CHW	672,182	mBtu	(2)
0440	Commons Hall	84,500	009238	HHW	266,081	mBtu	
0441	Krueger Residence Hall	112,133	009091	ELE	43,411	kWh	
0441	Krueger Residence Hall	112,133	009828	ELE	21,398	kWh	
0441	Krueger Residence Hall	112,133	002504	CHW	633,393	mBtu	# (1)
0441	Krueger Residence Hall	112,133	002500	HHW	335,468	mBtu	# (1)
0442	Dunn Residence Hall	112,133	009095	ELE	88,560	kWh	(2)
0442	Dunn Residence Hall	112,133	002519	CHW	752,661	mBtu	
0442	Dunn Residence Hall	112,133	002515	HHW	442,222	mBtu	# (1)
0447	Aston Residence Hall	113,388	009087	ELE	73,796	kWh	
0447	Aston Residence Hall	113,388	002474	CHW	911,344	mBtu	
0447	Aston Residence Hall	113,388	002470	HHW	631,837	mBtu	# (1)
0443	Oceanography & Meteorology Building	180,316	005322	ELE	178,098	kWh	
0443	Oceanography & Meteorology Building	180,316	005323	ELE	60,860	kWh	
0443	Oceanography & Meteorology Building	180,316	006388	CHW	1,079,103	mBtu	
0443	Oceanography & Meteorology Building	180,316	006392	HHW	530,596	mBtu	(2)
0444	Peterson Building	84,831	004714	ELE	172,220	kWh	
0444	Peterson Building	84,831	002922	CHW	960,315	mBtu	# (1)
0444	Peterson Building	84,831	006435	HHW	435,012	mBtu	
0445-0517	Teague Research Center and DPC Annex	89,735	003948	ELE	23,081	kWh	
0445-0517	Teague Research Center and DPC Annex	89,735	004719	ELE	48,290	kWh	
0445	Teague Research Center	63,515	006411	CHW	238,890	mBtu	
0445	Teague Research Center	63,515	006415	HHW	67,735	mBtu	
0517	DPC Annex	26,220	006563	CHW	414,468	mBtu	
0517	DPC Annex	26,220	006567	HHW	226,508	mBtu	
0446	Rudder Theatre Complex	209,293	002977	ELE	99,924	kWh	# (1)
0446	Rudder Theatre Complex	209,293	002980	ELE	32,053	kWh	# (1)
0446	Rudder Theatre Complex	209,293	004297	CHW	1,518,795	mBtu	# (1)
0446	Rudder Theatre Complex	209,293	004309	HHW	1,032,595	mBtu	# (1)
0446	Rudder Tower	92,947	001550	ELE	27,574	kWh	
0446	Rudder Tower	92,947	001551	ELE	54,867	kWh	
0446	Rudder Tower	92,947	002455	CHW	510,793	mBtu	
0446	Rudder Tower	92,947	002459	HHW	211,714	mBtu	
0448	Adams Band Hall	55,248	000978	ELE	64,026	kWh	
0448	Adams Band Hall	55,248	002555	CHW	470,753	mBtu	# (1)
0448	Adams Band Hall	55,248	002566	HHW	306,364	mBtu	# (1)
0449	Biological Sciences Building - West	96,038	003978	ELE	166,807	kWh	
0449	Biological Sciences Building - West	96,038	003981	CHW	1,026,452	mBtu	
0449	Biological Sciences Building - West	96,038	003985	HHW	386,543	mBtu	

Table I-1 November 2017 Monthly Consumption for TAMU Buildings (*Continued*)

TAMU#	Building Name	Area (ft^2)	MeterID	Type	Monthly Consumption	Units	Comments
0450	Duncan Dining Hall	128,482	000300	ELE	103,069	kWh	
0450	Duncan Dining Hall	128,482	002998	CHW	569,599	mBtu	
0450	Duncan Dining Hall	128,482	003009	HHW	81,247	mBtu	
0454	MSC (East Main)	392,000	007600	ELE	276,589	kWh	
0454	MSC (West Main)	392,000	007601	ELE	203,889	kWh	
0454	MSC BOR	392,000	008047	ELE	23,737	kWh	
0454	MSC	392,000	007584	CHW	1,972,751	mBtu	
0454	MSC BOR	392,000	004184	CHW	372,071	mBtu	
0454	MSC	392,000	007585	HHW	370,851	mBtu	
0454	MSC BOR	392,000	004196	HHW	269,355	mBtu	
0456	Military Sciences Building	43,808	006939	CHW	410,028	mBtu	*
0456	Military Sciences Building	43,808	006943	HHW	214,835	mBtu	*
0457	TAES Annex Building	16,364	005863	ELE	13,078	kWh	
0457	TAES Annex Building	16,364	005913	CHW	55,451	mBtu	# (1)
0457	TAES Annex Building	16,364	005917	HHW	28,713	mBtu	
0461	Coke Building	24,466	004008	ELE	29,127	kWh	
0461	Coke Building	24,466	005307	CHW	90,163	mBtu	
0461	Coke Building	24,466	004023	HHW	13,182	mBtu	
0462	Academic Building	82,555	005861	ELE	18,910	kWh	
0462	Academic Building	82,555	005903	ELE	36,186	kWh	
0462	Academic Building	82,555	005905	CHW	426,711	mBtu	
0462	Academic Building	82,555	005909	HHW	304,859	mBtu	
0463	Psychology Building	48,215	001575	ELE	45,113	kWh	
0463	Psychology Building	48,215	002941	CHW	378,178	mBtu	(2)
0463	Psychology Building	48,215	002945	HHW	76,226	mBtu	
0464	State Chemist Building	20,027	005839	ELE	6,880	kWh	(2)
0464	State Chemist Building	20,027	005837	ELE	5,484	mBtu	(2)
0464	State Chemist Building	20,027	005841	HHW	20,039	mBtu	
0465	Butler Hall	29,699	003997	ELE	33,173	kWh	
0465	Butler Hall	29,699	004000	CHW	167,874	mBtu	
0465	Butler Hall	29,699	004004	HHW	68,164	mBtu	
0467	Biological Sciences Building - East	62,273	001543	ELE	184,371	kWh	
0467	Biological Sciences Building - East	62,273	003851	CHW	647,470	mBtu	# (1)
0467	Biological Sciences Building - East	62,273	003862	HHW	163,270	mBtu	
0468	Evans Library	712,093	000304	ELE	235,256	kWh	
0468	Evans Library	712,093	000318	ELE	122,845	kWh	
0468	Evans Library	712,093	000319	ELE	93,199	kWh	
0468	Evans Library	712,093	000320	ELE	85,010	kWh	
0468	Evans Library	712,093	006429	ELE	78,832	kWh	
0468	Evans Library	712,093	003701	CHW	1,094,537	mBtu	
0468	Evans Library	712,093	003895	CHW	988,923	mBtu	
0468	Evans Library	712,093	003903	CHW	245,156	mBtu	
0468	Evans Library	712,093	003911	CHW	1,004,783	mBtu	
0468	Evans Library	712,093	003712	HHW	205,769	mBtu	# (1)
0468	Evans Library	712,093	003899	HHW	208,622	mBtu	
0468	Evans Library	712,093	003907	HHW	38,633	mBtu	
0468	Evans Library	712,093	003922	HHW	117,178	mBtu	
0468	Evans Library	712,093	005303	HHW	50,473	mBtu	
0469	Central Campus Parking Garage	251,304	000306	ELE	43,854	kWh	*
0469	Central Campus Parking Garage	2,844	003716	CHW	16,980	mBtu	
0469	Central Campus Parking Garage	2,844	003720	HHW	11,832	mBtu	
0470	Glasscock History Bldg	39,887	006407	ELE	19,405	kWh	
0470	Glasscock History Bldg	39,887	006638	CHW	128,015	mBtu	
0470	Glasscock History Bldg	39,887	006642	HHW	37,639	mBtu	# (1)
0471	Pavilion	40,062	001455	ELE	32,767	kWh	
0471	Pavilion	40,062	002769	CHW	155,376	mBtu	
0471	Pavilion	40,062	002780	HHW	27,776	mBtu	
0472	Animal Industries	44,856	009042	ELE	52,534	kWh	
0472	Animal Industries	44,856	009109	CHW	292,260	mBtu	
0472	Animal Industries	44,856	009113	HHW	179,004	mBtu	
0473	Williams Administration Building	69,898	007945	ELE	43,661	kWh	
0473	Williams Administration Building	69,898	007946	CHW	291,413	mBtu	
0473	Williams Administration Building	69,898	007947	HHW	147,990	mBtu	
0474	YMCA Building	36,035	007524	ELE	21,851	kWh	
0474	YMCA Building	36,035	007525	CHW	92,084	mBtu	
0474	YMCA Building	36,035	007526	HHW	14,007	mBtu	# (1)
0476	Francis Hall	36,850	008015	ELE	33,283	kWh	
0476	Francis Hall	36,850	008033	CHW	205,579	mBtu	
0476	Francis Hall	36,850	008034	HHW	32,921	mBtu	
0477	Anthropology Building	51,592	001558	ELE	33,182	kWh	
0477	Anthropology Building	51,592	003664	CHW	265,244	mBtu	# (1)
0477	Anthropology Building	51,592	003668	HHW	106,433	mBtu	# (1)

Table I-1 November 2017 Monthly Consumption for TAMU Buildings (*Continued*)

TAMU#	Building Name	Area (ft^2)	MeterID	Type	Monthly Consumption	Units	Comments
0478	Scoates Hall	62,228	007961	ELE	53,916	kWh	
0478	Scoates Hall	62,228	007968	CHW	269,040	mBtu	
0478	Scoates Hall	62,228	007969	HHW	113,474	mBtu	
0480	Bolton Hall	39,686	006845	ELE	31,312	kWh	
0480	Bolton Hall	39,686	007012	CHW	142,099	mBtu	
0480	Bolton Hall	39,686	007016	HHW	31,574	mBtu	
0481	Heaton Hall	13,640	005712	ELE	NA	kWh	
0481	Heaton Hall	13,640	007531	CHW	104,609	mBtu	
0481	Heaton Hall	13,640	007535	HHW	66,072	mBtu	
0482	Fermier Hall	19,074	005779	ELE	15,876	kWh	
0482	Fermier Hall	19,074	005878	CHW	93,342	mBtu	
0482	Fermier Hall	19,074	005881	HHW	16,564	mBtu	
0483	Thompson Hall	81,404	003688	ELE	68,361	kWh	
0483	Thompson Hall	81,404	003887	CHW	248,203	mBtu	
0483	Thompson Hall	81,404	003891	HHW	34,091	mBtu	
0484	Chemistry Building	205,393	007152	ELE	172,223	kWh	(2)
0484	Chemistry Building	205,393	007556	ELE	10,589	kWh	
0484	Chemistry Building	205,393	007557	ELE	7,892	kWh	(2)
0484	Chemistry Building	205,393	007559	ELE	160,697	kWh	
0484	Chemistry Building	205,393	007028	CHW	1,426,822	mBtu	
0484	Chemistry Building	205,393	007223	CHW	2,148,585	mBtu	
0484	Chemistry Building	205,393	007032	HHW	395,442	mBtu	
0484	Chemistry Building	205,393	007227	HHW	1,097,112	mBtu	
0490	Halbouty Geosciences Building	120,874	006691	ELE	56,628	kWh	
0490	Halbouty Geosciences Building	120,874	006695	ELE	93,669	kWh	
0490	Halbouty Geosciences Building	120,874	006896	CHW	1,056,736	mBtu	
0490	Halbouty Geosciences Building	120,874	006913	CHW	417,443	mBtu	
0490	Halbouty Geosciences Building	120,874	006900	HHW	441,193	mBtu	
0490	Halbouty Geosciences Building	120,874	006917	HHW	194,757	mBtu	
0492	Civil Engineering Building	56,537	005783	ELE	52,185	kWh	*
0492	Civil Engineering Building	56,537	005950	CHW	207,733	mBtu	
0492	Civil Engineering Building	56,537	005954	HHW	65,386	mBtu	
0495	Sbisa Dining Hall	94,233	000352	ELE	142,015	kWh	
0495	Sbisa Dining Hall	94,233	000353	ELE	123,588	kWh	
0495	Sbisa Dining Hall	94,233	001951	CHW	917,590	mBtu	
0495	Sbisa Dining Hall	94,233	001957	HHW	142,703	mBtu	
0496	Utilities & Energy Services Central Office	46,110	007706	ELE	9,581	kWh	*, (2)
0496	Utilities & Energy Services Central Office	46,110	006929	CHW	91,752	mBtu	(2)
0496	Utilities & Energy Services Central Office	46,110	006933	HHW	8,404	mBtu	(2)
0499	Engineering Innovation Center	28,339	001561	ELE	23,123	kWh	
0499	Engineering Innovation Center	28,339	002672	CHW	71,053	mBtu	*
0499	Engineering Innovation Center	28,339	002683	HHW	50,057	mBtu	*
0501	Concrete Materials Laboratory	9,600	005791	ELE	8,193	kWh	
0506	Nagle Hall	32,306	001484	ELE	3,191	kWh	(2)
0506	Nagle Hall	32,306	003619	CHW	160,829	mBtu	(2)
0506	Nagle Hall	32,306	003623	HHW	23,251	mBtu	(2)
0507	Veterinary Medical Science Building	69,367	003013	ELE	78,673	kWh	*
0507	Veterinary Medical Science Building	69,367	003640	CHW	899,292	mBtu	
0507	Veterinary Medical Science Building	69,367	003644	HHW	422,677	mBtu	
0508	Veterinary Teaching Hospital	96,416	003022	ELE	81,409	kWh	
0508-1026	Veterinary Teaching Hospital and Veterinary Medicine Administration	191,096	004166	CHW	1,552,674	mBtu	
0508-1026	Veterinary Teaching Hospital and Veterinary Medicine Administration	191,096	009694	HHW	626,571	mBtu	
0511	Heep Laboratory Building	40,476	005787	ELE	38,506	kWh	(2)
0511	Heep Laboratory Building	40,476	005821	CHW	333,824	mBtu	(2)
0511	Heep Laboratory Building	40,476	005825	HHW	217,613	mBtu	(2)
0512	All Faiths Chapel	8,999	004340	ELE	7,073	kWh	
0512	All Faiths Chapel	8,999	004288	CHW	66,125	mBtu	
0512	All Faiths Chapel	8,999	004293	HHW	12,142	mBtu	(2)
0513	Doherty Building	42,336	000299	ELE	49,554	kWh	
0513	Doherty Building	42,336	002898	CHW	580,265	mBtu	
0513	Doherty Building	42,336	002902	HHW	348,742	mBtu	
0514	Munnerlyn Astronomy & Space Sciences Engineering	22,134	007558	ELE	12,170	kWh	
0514	Munnerlyn Astronomy & Space Sciences Engineering	22,134	007487	CHW	70,120	mBtu	(2)
0514	Munnerlyn Astronomy & Space Sciences Engineering	22,134	007491	HHW	19,718	mBtu	
0516	Computing Services Center	30,014	005259	ELE	524,321	kWh	
0516	Computing Services Center	30,014	003959	CHW	1,703,362	mBtu	(2)
0516	Computing Services Center	30,014	003963	HHW	7,975	mBtu	
0518	Zachry Engineering Education Complex	464,400	009874	ELE	132,769	kWh	*
0518	Zachry Engineering Education Complex	464,400	009875	ELE	88,825	kWh	*
0518	Zachry Engineering Education Complex	464,400	009964	CHW	2,019,114	mBtu	*
0518	Zachry Engineering Education Complex	464,400	009965	HHW	750,056	mBtu	*
0520	Beutel Health Center	63,318	003785	ELE	62,738	kWh	
0520	Beutel Health Center	63,318	003933	CHW	391,756	mBtu	(1)
0520	Beutel Health Center	63,318	003944	HHW	69,048	mBtu	(2)

Table I-1 November 2017 Monthly Consumption for TAMU Buildings (*Continued*)

TAMU#	Building Name	Area (ft^2)	MeterID	Type	Monthly Consumption	Units	Comments
0521	Heldenfels Hall	104,949	001547	ELE	100,027	kWh	
0521	Heldenfels Hall	104,949	002962	CHW	830,273	mBtu	
0521	Heldenfels Hall	104,949	002973	HHW	198,051	mBtu	
0524	Blocker Building	257,953	001545	ELE	202,206	kWh	
0524	Blocker Building	257,953	002914	CHW	834,243	mBtu	(2)
0524	Blocker Building	257,953	002918	HHW	89,898	mBtu	(2)
0548	Clements Residence Hall	62,156	000048	ELE	41,391	kWh	
0548	Clements Residence Hall	62,156	002729	CHW	780,422	mBtu	*
0548	Clements Residence Hall	62,156	002740	HHW	452,261	mBtu	*
0549	Haas Residence Hall	69,668	001398	ELE	47,147	kWh	
0549	Haas Residence Hall	69,668	002983	CHW	830,391	mBtu	
0549	Haas Residence Hall	69,668	002994	HHW	659,850	mBtu	(1)
0550	McFadden Residence Hall	62,156	000339	ELE	43,060	kWh	
0550	McFadden Residence Hall	62,156	002188	CHW	767,333	mBtu	
0550	McFadden Residence Hall	62,156	002192	HHW	535,354	mBtu	
0652	Neeley Residence Hall	69,668	000056	ELE	52,463	kWh	
0652	Neeley Residence Hall	69,668	002147	CHW	352,890	mBtu	
0652	Neeley Residence Hall	69,668	002151	HHW	182,365	mBtu	(2)
0653	Hobby Residence Hall	62,156	000057	ELE	50,350	kWh	
0653	Hobby Residence Hall	62,156	002401	CHW	691,584	mBtu	
0653	Hobby Residence Hall	62,156	002405	HHW	358,950	mBtu	
0682	Wisenbaker Engineering Research Center	177,704	005246	ELE	232,615	kWh	
0682	Wisenbaker Engineering Research Center	177,704	003879	CHW	1,228,739	mBtu	
0682	Wisenbaker Engineering Research Center	177,704	003883	HHW	365,192	mBtu	
0740	McNew Laboratory	20,904	005874	ELE	45,961	kWh	(2)
0740	McNew Laboratory	20,904	005974	CHW	328,790	mBtu	(2)
0740	McNew Laboratory	20,904	005968	HHW	6,184	mBtu	(2)
0806	Soil Testing Labs	5,544	006875	ELE	20,599	kWh	
0815	Entomology Research Lab	17,618	005799	ELE	30,721	kWh	
0815	Entomology Research Lab	17,618	006043	CHW	117,633	mBtu	
0880	TVMC-Small Animal Building	3,260	005958	CHW	26,911	mBtu	
0880	TVMC-Small Animal Building	3,260	005962	HHW	150	mBtu	
0971	Dollar Data Center	67,799	010002	ELE	113,707	kWh	
0971	Dollar Data Center	67,799	010003	ELE	48,486	kWh	*
0972	Laboratory Animal Care Building	52,178	007063	ELE	114,229	kWh	
0972	Laboratory Animal Care Building	52,178	007067	ELE	50,408	kWh	
0972	Laboratory Animal Care Building	52,178	007071	CHW	1,422,551	mBtu	
0972	Laboratory Animal Care Building	52,178	006991	HHW	282,390	mBtu	
1020	Vivarium III	12,234	005857	ELE	24,690	kWh	
1020	Vivarium III	12,234	005997	CHW	195,250	mBtu	
1020	Vivarium III	12,234	006001	HHW	100,812	mBtu	
1026	Veterinary Medicine Administration	94,680	006072	ELE	127,966	kWh	*
1026	Veterinary Medicine Administration	94,680	006049	CHW	919,806	mBtu	
1041	Texas Vet Med Diagnostic Lab	55,169	001466	ELE	53,848	kWh	(2)
1041	Texas Vet Med Diagnostic Lab	55,169	001539	ELE	28,700	kWh	(2)
1041	Texas Vet Med Diagnostic Lab	55,169	003817	CHW	297,883	mBtu	(2)
1041	Texas Vet Med Diagnostic Lab	55,169	004137	CHW	637,101	mBtu	(2)
1041	Texas Vet Med Diagnostic Lab	55,169	003821	HHW	33,549	mBtu	(2)
1041	Texas Vet Med Diagnostic Lab	55,169	004130	HHW	57,723	mBtu	(2)
1042	Forest Science Laboratory Building	9,632	006036	ELE	21,802	kWh	
1085	Veterinary Small Animal Hospital	103,440	004136	ELE	230,607	kWh	
1085	Veterinary Small Animal Hospital	103,440	003656	CHW	1,284,102	mBtu	
1085	Veterinary Small Animal Hospital	103,440	003660	HHW	511,353	mBtu	
1089	Utilities Energy Office Annex	2,937	006964	ELE	4,861	kWh	
1146	Biological Control Facility	13,492	005795	ELE	32,346	kWh	
1146	Biological Control Facility	13,492	005887	CHW	125,003	mBtu	
1146	Biological Control Facility	13,492	005891	HHW	45,839	mBtu	
1156	Physical Plant Administration & Shops	101,704	007483	ELE	99,007	kWh	
1156	Physical Plant Administration & Shops	101,704	007679	CHW	222,240	mBtu	(2)
1156	Physical Plant Administration & Shops	101,704	007683	HHW	118,264	mBtu	
1184	Veterinary Anatomic Pathology	17,223	001445	ELE	54,722	kWh	
1184	Veterinary Anatomic Pathology	17,223	006995	CHW	206,683	mBtu	
1184	Veterinary Anatomic Pathology	17,223	006999	HHW	91,453	mBtu	
1194	Veterinary Large Animal Hospital	140,865	005256	ELE	91,660	kWh	
1194	Veterinary Large Animal Hospital	140,865	003016	ELE	73,018	kWh	
1194	Veterinary Large Animal Hospital	140,865	007455	ELE	43,946	kWh	
1194	Veterinary Large Animal Hospital	140,865	003648	CHW	1,305,641	mBtu	
1194	Veterinary Large Animal Hospital	140,865	007456	CHW	266,245	mBtu	
1194	Veterinary Large Animal Hospital	140,865	003652	HHW	772,129	mBtu	
1194	Veterinary Large Animal Hospital	140,865	007457	HHW	49,296	mBtu	
1197	Veterinary Research Building	114,666	006355	ELE	66,857	kWh	
1197	Veterinary Research Building	114,666	006359	ELE	34,174	kWh	
1197	Veterinary Research Building	114,666	006062	CHW	1,455,574	mBtu	
1197	Veterinary Research Building	114,666	006066	HHW	447,958	mBtu	

Table I-1 November 2017 Monthly Consumption for TAMU Buildings (*Continued*)

TAMU#	Building Name	Area (ft^2)	MeterID	Type	Monthly Consumption	Units	Comments
1416	Hullabaloo Residence Hall	253,452	007845	ELE	182,282	kWh	#, (1)
1416	Hullabaloo Residence Hall	253,452	007846	CHW	865,546	mBtu	
1416	Hullabaloo Residence Hall	253,452	007847	HHW	144,647	mBtu	
1450	University Apartments - Laundry at the Gardens	1,428	006885	ELE	5,640	kWh	
1451	University Apartments - The Gardens J	33,535	006981	ELE	19,062	kWh	
1452	University Apartments - The Gardens K	33,535	006979	ELE	18,695	kWh	
1453	University Apartments - The Gardens L	33,535	006884	ELE	18,352	kWh	
1454	University Apartments - The Gardens F	33,535	006980	ELE	20,098	kWh	*
1455	University Apartments - The Gardens G	33,535	006882	ELE	18,157	kWh	*
1456	University Apartments - The Gardens H	33,535	007962	ELE	17,174	kWh	
1457	University Apartments - The Gardens M	33,535	007503	ELE	17,805	kWh	
1458	University Apartments - The Gardens N	33,535	007504	ELE	18,189	kWh	
1459	University Apartments - The Gardens P	33,535	007505	ELE	20,191	kWh	
1460	University Apartments - The Gardens Q	33,535	007506	ELE	19,945	kWh	
1497	Utilities & Energy Services Business Office	3,480	007082	ELE	4,099	kWh	
1497	Utilities & Energy Services Business Office	3,480	006341	CHW	16,619	mBtu	
1497	Utilities & Energy Services Business Office	3,480	006345	HHW	3,612	mBtu	
1501	Kleberg Center	165,031	007449	ELE	269,806	kWh	*
1501	Kleberg Center	165,031	002624	CHW	823,191	mBtu	*
1501	Kleberg Center	165,031	002628	HHW	708,006	mBtu	*, (1)
1502	Heep Center	158,979	001556	ELE	249,490	kWh	
1502	Heep Center	158,979	002599	CHW	1,370,982	mBtu	
1502	Heep Center	158,979	002603	HHW	273,153	mBtu	
1503	Cater-Mattil Hall	27,958	007977	ELE	89,737	kWh	
1503	Cater-Mattil Hall	27,958	008001	CHW	320,405	mBtu	
1504	Reynolds Medical Sciences Building	169,859	003975	ELE	273,811	kWh	
1504	Reynolds Medical Sciences Building	169,859	003989	CHW	1,777,158	mBtu	
1504	Reynolds Medical Sciences Building	169,859	003993	HHW	635,054	mBtu	
1505	Rosenthal Meat Science & Technology Center	30,889	003627	ELE	124,142	kWh	*
1505	Rosenthal Meat Science & Technology Center	30,889	002573	CHW	172,292	mBtu	*
1505	Rosenthal Meat Science & Technology Center	30,889	002577	HHW	0	mBtu	*
1506	Horticulture-Forest Science Building	118,648	001544	ELE	143,115	kWh	
1506	Horticulture-Forest Science Building	118,648	003967	CHW	476,423	mBtu	
1506	Horticulture-Forest Science Building	118,648	003971	HHW	149,691	mBtu	
1507	Biochemistry-Biophysics Building	166,079	001459	ELE	161,760	kWh	
1507	Biochemistry-Biophysics Building	166,079	001460	ELE	168,904	kWh	
1507	Biochemistry-Biophysics Building	166,079	003025	CHW	1,318,958	mBtu	
1507	Biochemistry-Biophysics Building	166,079	003029	HHW	709,514	mBtu	
1508	Price Hobgood Ag. Engineering Research Lab	27,666	005638	ELE	23,642	kWh	
1508	Price Hobgood Ag. Engineering Research Lab	27,666	006005	CHW	133,883	mBtu	(2)
1508	Price Hobgood Ag. Engineering Research Lab	27,666	006009	HHW	61,971	mBtu	(2)
1509	Medical Sciences Library	84,183	000350	ELE	86,413	kWh	(2)
1509	Medical Sciences Library	84,183	003777	CHW	342,763	mBtu	(2)
1509	Medical Sciences Library	84,183	003781	HHW	263,612	mBtu	(2)
1510	Wehner Building	259,681	006849	ELE	196,696	kWh	
1510	Wehner Building	259,681	006685	ELE	227,824	kWh	
1510	Wehner Building	259,681	002687	CHW	1,396,096	mBtu	
1510	Wehner Building	259,681	002691	HHW	372,192	mBtu	
1511	West Campus Library Facility	68,125	004342	ELE	88,527	kWh	
1511	West Campus Library Facility	68,125	004313	CHW	393,370	mBtu	
1511	West Campus Library Facility	68,125	004318	HHW	115,843	mBtu	
1512	Southern Crop Improvement Greenhouse	48,154	005931	ELE	89,037	kWh	#, (1)
1513	Borlaug Center for Southern Crop Improvement	68,739	005802	ELE	302,316	kWh	
1513	Borlaug Center for Southern Crop Improvement	68,739	005936	CHW	827,012	mBtu	
1513	Borlaug Center for southern Crop Improvement	68,739	005895	HHW	193,057	mBtu	
1518	TX School of Rural Public Health A	69,079	005273	ELE	67,338	kWh	
1519	TX School of Rural Public Health B	24,761	005274	ELE	56,833	kWh	#, (1)
1520	TX School of Rural Public Health C	13,264	005275	ELE	105,582	kWh	#, (1)
1518-1519-1520	TX School of Rural Public Health A,B,C	107,104	005294	CHW	821,275	mBtu	
1518-1519-1520	TX School of Rural Public Health A,B,C	107,104	005298	HHW	286,217	mBtu	
1525	Nuclear Magnetic Resonance Facility	37,282	006718	ELE	82,647	kWh	
1525	Nuclear Magnetic Resonance Facility	37,282	006715	CHW	714,547	mBtu	
1525	Nuclear Magnetic Resonance Facility	37,282	006716	HHW	476,252	mBtu	
1530	Interdisciplinary Life Sciences Building	218,540	006286	ELE	362,290	kWh	
1530	Interdisciplinary Life Sciences Building	218,540	006288	ELE	214,910	kWh	
1530	Interdisciplinary Life Sciences Building	218,540	006290	CHW	2,542,053	mBtu	
1530	Interdisciplinary Life Sciences Building	218,540	006294	HHW	1,094,666	mBtu	
1535	Agriculture and Life Sciences Building	168,353	007205	ELE	116,313	kWh	
1535	Agriculture and Life Sciences Building	168,353	007206	CHW	470,935	mBtu	
1535	Agriculture and Life Sciences Building	168,353	007207	HHW	37,255	mBtu	
1536	AgriLife Services Building	80,907	007571	ELE	41,800	kWh	
1536	AgriLife Services Building	80,907	007572	CHW	172,082	mBtu	
1536	AgriLife Services Building	80,907	007573	HHW	45,117	mBtu	
1537	Wildlife Fisheries & Ecological Sciences Building	78,480	009982	ELE	87,497	kWh	
1537	Wildlife Fisheries & Ecological Sciences Building	78,480	009983	CHW	693,976	mBtu	
1537	Wildlife Fisheries & Ecological Sciences Building	78,480	009984	HHW	338,421	mBtu	

Table I-1 November 2017 Monthly Consumption for TAMU Buildings (*Continued*)

TAMU#	Building Name	Area (ft^2)	MeterID	Type	Monthly Consumption	Units	Comments
1538	Agriculture Program Visitors Center	12,923	007209	ELE	12,424	kWh	
1538	Agriculture Program Visitors Center	12,923	007210	CHW	60,853	mBtu	
1538	Agriculture Program Visitors Center	12,923	007211	HHW	13,781	mBtu	
1540	Physical Education Activity Program Building	116,900	007881	ELE	72,000	kWh	
1540	Physical Education Activity Program Building	116,900	007878	CHW	368,561	mBtu	
1540	Physical Education Activity Program Building	116,900	007879	HHW	153,124	mBtu	
1542	Human Clinical Research Building	22,052	009693	ELE	54,004	kWh	
1542	Human Clinical Research Building	22,052	009683	CHW	299,287	mBtu	
1542	Human Clinical Research Building	22,052	009687	HHW	124,252	mBtu	
1544	Cain Garage	498,425	009824	ELE	40,597	kWh	
1550	Olsen Field at Bluebell Park	60,537	007560	ELE	89,602	kWh	
1554	Reed Arena	230,000	007582	ELE	179,375	kWh	
1554	Reed Arena	230,000	006243	ELE	680	kWh	*
1554	Reed Arena	230,000	006244	ELE	85,901	kWh	*
1554-1558	Reed Arena and Cox-McFerrin Center	328,185	007576	CHW	2,028,286	mBtu	
1554-1558	Reed Arena and Cox-McFerrin Center	328,185	007578	HHW	791,258	mBtu	
1558	Cox-McFerrin Center for Aggie Basketball	98,185	007581	ELE	80,711	kWh	
1558	Cox-McFerrin Center for Aggie Basketball	98,185	007575	CHW	430,526	mBtu	
1558	Cox-McFerrin Center for Aggie Basketball	98,185	007577	HHW	118,671	mBtu	(2)
1559	West Campus Parking Garage	1,541,457	001453	ELE	153,597	kWh	
1559	West Campus Parking Garage	13,000	004322	CHW	42,679	mBtu	
1559	West Campus Parking Garage	13,000	004327	HHW	13,722	mBtu	(1)
1560	Student Recreation Center	334,642	000363	ELE	346,577	kWh	
1560	Student Recreation Center	334,642	000366	ELE	357,915	kWh	
1560	Student Recreation Center	334,642	002933	CHW	3,463,283	mBtu	
1560	Student Recreation Center	334,642	002937	HHW	1,654,274	mBtu	
1589-1590	White Creek Apartment 1 and White Creek Apts Activity Center	176,454	009197	ELE	102,405	kWh	
1589-1590	White Creek Apartment 1 and White Creek Apts Activity Center	176,454	009198	CHW	435,756	mBtu	
1589-1590	White Creek Apartment 1 and White Creek Apts Activity Center	176,454	009199	HHW	117,161	mBtu	
1591	White Creek Apartment 2	179,467	008528	ELE	113,105	kWh	
1591	White Creek Apartment 2	179,467	008529	CHW	345,646	mBtu	
1591	White Creek Apartment 2	179,467	008533	HHW	78,262	mBtu	
1592	White Creek Apartment 3	179,467	008538	ELE	112,534	kWh	
1592	White Creek Apartment 3	179,467	008539	CHW	418,431	mBtu	
1592	White Creek Apartment 3	179,467	008543	HHW	63,535	mBtu	
1600	Gilchrist TTI Building	67,143	005286	ELE	51,074	kWh	
1600	Gilchrist TTI Building	67,143	002649	CHW	225,217	mBtu	
1600	Gilchrist TTI Building	67,143	002653	HHW	58,811	mBtu	
1601	International Ocean Discovery Building	86,576	006351	ELE	110,475	kWh	(2)
1601	International Ocean Discovery Building	86,576	006382	CHW	178,997	mBtu	(2)
1601	International Ocean Discovery Building	86,576	008144	CHW	40,148	mBtu	(2)
1601	International Ocean Discovery Building	86,576	008145	HHW	26,314	mBtu	(2)
1601	International Ocean Discovery Building	86,576	009829	HHW	55,442	mBtu	(2)
1604	Offshore Technology Research Center	40,014	006659	ELE	91,449	kWh	
1604	Offshore Technology Research Center	40,014	006660	ELE	222	kWh	(2)
1604	Offshore Technology Research Center	40,014	008142	CHW	442,339	mBtu	*
1604	Offshore Technology Research Center	40,014	008143	HHW	190,761	mBtu	*
1606	George Bush Presidential Library & Museum	121,678	000244	ELE	106,962	kWh	
1606	George Bush Presidential Library & Museum	121,678	002808	CHW	914,865	mBtu	
1606	George Bush Presidential Library & Museum	121,678	002812	HHW	316,718	mBtu	(1)
1607	Allen Building	133,327	000243	ELE	93,315	kWh	
1607	Allen Building	133,327	002800	CHW	366,100	mBtu	
1607	Allen Building	133,327	002804	HHW	50,625	mBtu	
1608	Annenberg Presidential Conference Center	65,688	000245	ELE	66,881	kWh	
1608	Annenberg Presidential Conference Center	65,688	002761	CHW	512,308	mBtu	
1608	Annenberg Presidential Conference Center	65,688	002765	HHW	252,216	mBtu	
1609	TTI Headquarters	66,707	006495	ELE	48,823	kWh	
1609	TTI Headquarters	66,707	006496	CHW	212,962	mBtu	
1609	TTI Headquarters	66,707	006497	HHW	40,862	mBtu	
1611	Engineering Research Building	68,807	008462	ELE	181,554	kWh	
1611	Engineering Research Building	68,807	008463	CHW	1,367,932	mBtu	
1611	Engineering Research Building	68,807	008467	HHW	613,502	mBtu	
1800	General Services Complex	203,369	005441	ELE	168,039	kWh	
1800	General Services Complex	203,369	005468	CHW	685,990	mBtu	
1800	General Services Complex	203,369	005472	HHW	62,608	mBtu	
1809	New TVMDL	90,000	009652	ELE	115,848	kWh	#, (1)
1809	New TVMDL	90,000	009653	ELE	85,144	mBtu	#, (1)
1809	New TVMDL	90,000	009647	CHW	1,204,151	mBtu	
1810	Office of the State Chemist Building	31,735	009073	ELE	61,346	kWh	
1810	Office of the State Chemist Building	31,735	005460	CHW	235,491	mBtu	
1810	Office of the State Chemist Building	31,735	005464	HHW	78,504	mBtu	
1811	Vet Med Research Bldg Addition	52,993	006705	ELE	225,174	kWh	
1811	Vet Med Research Bldg Addition	52,993	006706	CHW	803,216	mBtu	
1811	Vet Med Research Bldg Addition	52,993	006707	HHW	413,100	mBtu	

Table I-1 November 2017 Monthly Consumption for TAMU Buildings (*Continued*)

TAMU#	Building Name	Area (ft^2)	MeterID	Type	Monthly Consumption	Units	Comments
1812-1813	Veterinary Medicine Building 1 and 2	254,952	009404	ELE	182,414	kWh	
1813	Veterinary Medicine Building 2	116,492	009418	ELE	47,209	kWh	
1814	Veterinary Medicine Building 3	135,470	009405	ELE	260,393	kWh	
1812-1813-1814	Veterinary Medicine Building 1, 2 and 3	390,422	009676	CHW	2,362,347	mBtu	
1812-1813-1814	Veterinary Medicine Building 1, 2 and 3	390,422	009410	HHW	819,959	mBtu	
1900	Texas Institute for Genomic Medicine	34,120	005548	ELE	83,203	kWh	
1900	Texas Institute for Genomic Medicine	34,120	005545	CHW	897,038	mBtu	
1900	Texas Institute for Genomic Medicine	34,120	005546	HHW	360,983	mBtu	(1)
1904	Texas A&M Institute for Preclinical Studies A	113,559	006364	ELE	154,634	kWh	(2)
1904	Texas A&M Institute for Preclinical Studies A	113,559	006365	CHW	899,879	mBtu	*, (2)
1904	Texas A&M Institute for Preclinical Studies A	113,559	006366	HHW	411,605	mBtu	*, (2)
1910	National Center for Therapeutics Manufacturing	149,924	007517	ELE	190,570	kWh	
1910	National Center for Therapeutics Manufacturing	149,924	007518	ELE	185,510	kWh	
1910	National Center for Therapeutics Manufacturing	149,924	007519	CHW	3,062,959	mBtu	
1910	National Center for Therapeutics Manufacturing	149,924	007520	HHW	1,138,713	mBtu	
1911	Multi-Species Research Building	21,000	009138	ELE	27,778	kWh	
1911	Multi-Species Research Building	21,000	009129	CHW	285,386	mBtu	(1)
1911	Multi-Species Research Building	21,000	009133	HHW	174,139	mBtu	(1)
10226	NCTM Manufacturing Building	113,397	007648	CHW	2,633,527	mBtu	
10226	NCTM Manufacturing Building	113,397	007649	HHW	836,513	mBtu	
10226	NCTM Manufacturing Building	113,397	008133	HHW	240,506	mBtu	

1 mBtu = 1 000 Btu

NA: Not available
Monthly consumption in blue: Modified values
* : Missing data
# : Questionable data
(1): Consumption estimated and documented in the report *Part II - Data Analysis: Energy Use Estimation and Observations Section 2*
(2): Observation(s) documented in the report *Part II - Data Analysis: Energy Use Estimation and Observations Section 3*
(3): Missing data or changed consumption levels due to construction

II. Data Analysis: Energy Use Estimation and Observation

II-1 Meters with Missing Energy Consumption Data

During the month of November 2017, 35 meters in 20 buildings and complexes have missing daily data. The missing data have been filled in using consumption models based on the past data if available or using linear interpolation or some sort of average, and the monthly consumption has been estimated with the filled-in daily consumption. Table II-1 is the list of meters with missing data.

Table II-1 Meters with missing data during November 2017

Building No.	Building Name	MeterID	Type	Unit	Original Monthly Consumption	Estimated Monthly Consumption	# of Days	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
0367	Kyle Field	008862	ELE	kWh	29,324	101,627	23								M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
0325-0385	CE TTI Office & Lab Building	009123	CHW	mBtu	349,005	576,356	10	M	M	M	M	M	M	M	M	M	M																		
0325-0385	CE TTI Office & Lab Building	009124	HHW	mBtu	191,911	246,742	10	M	M	M	M	M	M	M	M	M	M																		
0387	Richardson Petroleum Engineering Building	005872	ELE	kWh	99,283	*	1																												
0456	Military Sciences Building	006939	CHW	mBtu	NA	410,028	30	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
0456	Military Sciences Building	006943	HHW	mBtu	NA	214,835	30	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
0469	Central Campus Parking Garage	000306	ELE	kWh	41,959	43,854	2																											M	M
0481	Heaton Hall	005712	ELE	kWh	NA	***	30																												
0492	Civil Engineering Building	005783	ELE	kWh	52,185	*	3																												
0496	Utilities & Energy Services Central Office	007706	ELE	kWh	9,581	*	1	M																											
0499	Engineering Innovation Center	002672	CHW	mBtu	NA	71,053	30	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
0499	Engineering Innovation Center	002683	HHW	mBtu	NA	50,057	30	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
0507	Veterinary Medical Science Building	003013	ELE	kWh	78,673	*	1								M																				
0518	Zachry Engineering Education Complex	009874	ELE	kWh	NA	132,769	30	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
0518	Zachry Engineering Education Complex	009875	ELE	kWh	NA	88,825	30	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
0518	Zachry Engineering Education Complex	009964	CHW	mBtu	NA	2,019,114	30	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
0518	Zachry Engineering Education Complex	009965	HHW	mBtu	NA	750,056	30	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
0548	Clements Residence Hall	002729	CHW	mBtu	780,422	*	3							M	M													M							
0548	Clements Residence Hall	002740	HHW	mBtu	452,261	*	1								M																				
0971	Dollar Data Center	010003	ELE	kWh	39,365	48,486	6	A	A	A	A	A	A																						
1026	Veterinary Medicine Administration	006072	ELE	kWh	127,966	*	1						M																						
1454	University Apartments - The Gardens F	006980	ELE	kWh	NA	20,098	30	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
1455	University Apartments - The Gardens G	006882	ELE	kWh	NA	18,157	30	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
1501	Kleberg Center	007449	ELE	kWh	245,073	269,806	3	M	M	M																									
1501	Kleberg Center	002624	CHW	mBtu	555,656	823,191	6	M	M	M	M	M	M																						
1501	Kleberg Center	002628	HHW	mBtu	520,146	**	6	M	M	M	M	M	M																						
1505	Rosenthal Meat Science & Technology Center	003627	ELE	kWh	(20,650,730)	124,142	3													M	M	M													
1505	Rosenthal Meat Science & Technology Center	002573	CHW	mBtu	87,011	172,292	18													M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
1505	Rosenthal Meat Science & Technology Center	002577	HHW	mBtu	0	0	18													A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
1554	Reed Arena	006243	ELE	kWh	NA	680	30	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
1554	Reed Arena	006244	ELE	kWh	NA	85,901	30	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
1604	Offshore Technology Research Center	008142	CHW	mBtu	388,436	442,339	3	M	M	M																									
1604	Offshore Technology Research Center	008143	HHW	mBtu	175,356	190,761	3	M	M	M																									
1904	Texas A&M Institute for Preclinical Studies A	006365	CHW	mBtu	722,004	899,879	11																				M	M	M	M	M	M	M	M	M
1904	Texas A&M Institute for Preclinical Studies A	006366	HHW	mBtu	248,979	411,605	11																				M	M	M	M	M	M	M	M	M

* Monthly consumption evaluated from the cumulative data is not affected by the missing data.
** See Table II-2 for the estimated consumption.
*** Consumption is not estiamted because reliable consumtpion model is not available.
NA: Not available

II-2 Meters with Estimated Consumption for Problematic Data

During the month of November 2017, 38 meters in 29 buildings have estimated daily consumption because the recorded consumption is found to be problematic or questionable. For each of these meters, alternative consumption has been estimated using the best possible method. Table II-2 lists these meters with indications of the days with estimated data. Detailed descriptions for individual cases follow.

Table II-2 Meters with problematic data during November 2017

Building No.	Building Name /MeterID(s)	Type	Unit	Original Monthly Consumption	Estimated Monthly Consumption	# of days	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
0293	Appelt Residence Hall																																			
	002062	CHW	mBtu	948,598	698,079	30	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
	002066	HHW	mBtu	499,667	329,269	30	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
0367	Kyle Field																																			
	008027	HHW	mBtu	47,119	1,263,804	30	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
0386	Jack E. Brown Chemical Engineering Building																																			
	002250	CHW	mBtu	3,341,151	2,207,341	13	M	M	M	M	M	M	M	M	M	M	M	M	M																	
	002254	HHW	mBtu	241,119	539,099	30	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
0404	Gainer Hall Dorm 5																																			
	009360	HHW	mBtu		89,726	16	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M														
0435	Harrington Education Center Office Tower																																			
	002796	HHW	mBtu	283,722	430,463	14	M	M	M	M	M	M	M	M	M								M	M	M	M	M									
0441	Krueger Residence Hall																																			
	002504	CHW	mBtu	28,917,623	633,393	30	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
	002500	HHW	mBtu	19,853,231	335,468	30	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
0442	Dunn Residence Hall																																			
	002515	HHW	mBtu	380,845	442,222	5																	M	M	M	M	M									
0444	Peterson Building																																			
	002922	CHW	mBtu	1,217,014	960,315	30	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
0446	Rudder Theatre Complex																																			
	002977	ELE	kWh	49,447	99,924	30	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
	002980	ELE	kWh	30,453	32,053	30	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
	004297	CHW	mBtu	497,884	1,518,795	30	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
	004309	HHW	mBtu	230,774	1,032,595	30	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
0447	Aston Residence Hall																																			
	002470	HHW	mBtu	552,003	631,837																		M	M	M	M	M	M	M							
0448	Adams Band Hall																																			
	002555	CHW	mBtu	301,888	470,753	30	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
	002566	HHW	mBtu	169,984	306,364	30	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
0457	TAES Annex Building																																			
	005913	CHW	mBtu	59,142	55,451	4								M	M										M	M										
0467	Biological Sciences Building - East																																			
	003851	CHW	mBtu	317,611	647,470	30	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
0468	Evans Library																																			
	003712	HHW	mBtu	426,797	205,769	18	M	M	M	M	M	M	M	M	M	M	M	M													M	M	M	M	M	M
0470	Glasscock History Bldg																																			
	006642	CHW	mBtu	14,391	37,639	11																				M	M	M	M	M	M	M	M	M	M	M
0474	YMCA Building																																			
	007526	HHW	mBtu	12,417	14,007	7	M	M	M	M	M	M	M																							
0477	Anthropology Building																																			
	003664	CHW	mBtu	359,848	265,244	30	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
	003668	HHW	mBtu	171,020	106,433	30	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
0520	Beutel Health Center																																			
	003933	CHW	mBtu	484,177	391,756	30	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
0549	Haas Residence Hall																																			
	002994	HHW	mBtu	440,688	659,850	30	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
1416	Hullabaloo Residence Hall																																			
	007845	ELE	kWh	-9,817,335	182,282	1														M																
1501	Kleberg Center																																			
	002628	HHW	mBtu	**	708,006	6							M						M	M	M	M	M													
1512	Southern Crop Improvement Greenhouse																																			
	005931	ELE	kWh	135,470	89,037	30	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
1519	TX School of Rural Public Health B																																			
	005274	ELE	kWh	105,582	56,833	30	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
1520	TX School of Rural Public Health C																																			
	005275	ELE	kWh	56,833	105,582	30	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
1559	West Campus Parking Garage																																			
	004327	HHW	mBtu	17,298	13,722	30	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
1606	George Bush Presidential Library & Museum																																			
	002812	HHW	mBtu	528,954	316,718	30	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
1809	New TVMDL																																			
	009652	ELE	kWh	115,845,810	115,848	30	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
	009653	ELE	kWh	85,144,500	85,144	30	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
1900	Texas Institute for Genomic Medicine																																			
	005546	HHW	mBtu	480,549	360,983	7					M	M		M	M	M	M	M																		
1911	Multi-Species Research Building																																			
	009129	CHW	mBtu	353,813	285,386	30	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
	009133	HHW	mBtu	246,557	174,139	30	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M

NA: Not available
** See Table II-1 for the original consumption.

Notes: The colored cells means the consumption for the day appears to be problematic. The letter in the colored cell indicates the method for estimation. M: model, F: multiplication factor, L: linear interpolation, A: average, and C: correction of the reset cumulative reading

Appelt Residence Hall (TAMU Bldg #293)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
CHW	002062	30	11/1/2017 – 11/30/2017	Model
HHW	002066	30	11/1/2017 – 11/30/2017	Model

Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
CHW	The consumption level is higher than the level during the past year.	10/6/2017– Ongoing
HHW	The consumption level is higher than the level during the past year.	10/6/2017– Ongoing

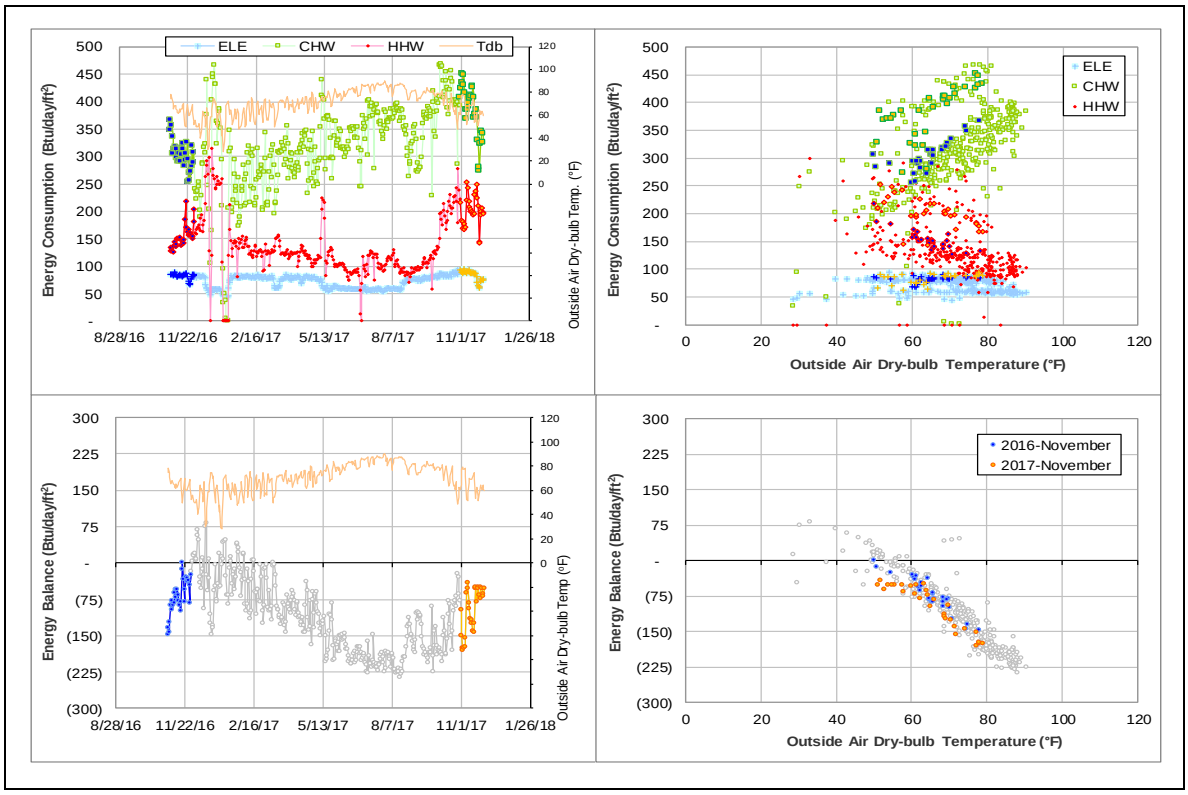
Changes in sensor readings related to the detected issues

Energy Type	Meter ID	Period	Type	Description
CHW	002062	10/6/2017– Ongoing	Flow rate	Increased
HHW	002066	10/6/2017– Ongoing	Flow rate	Increased

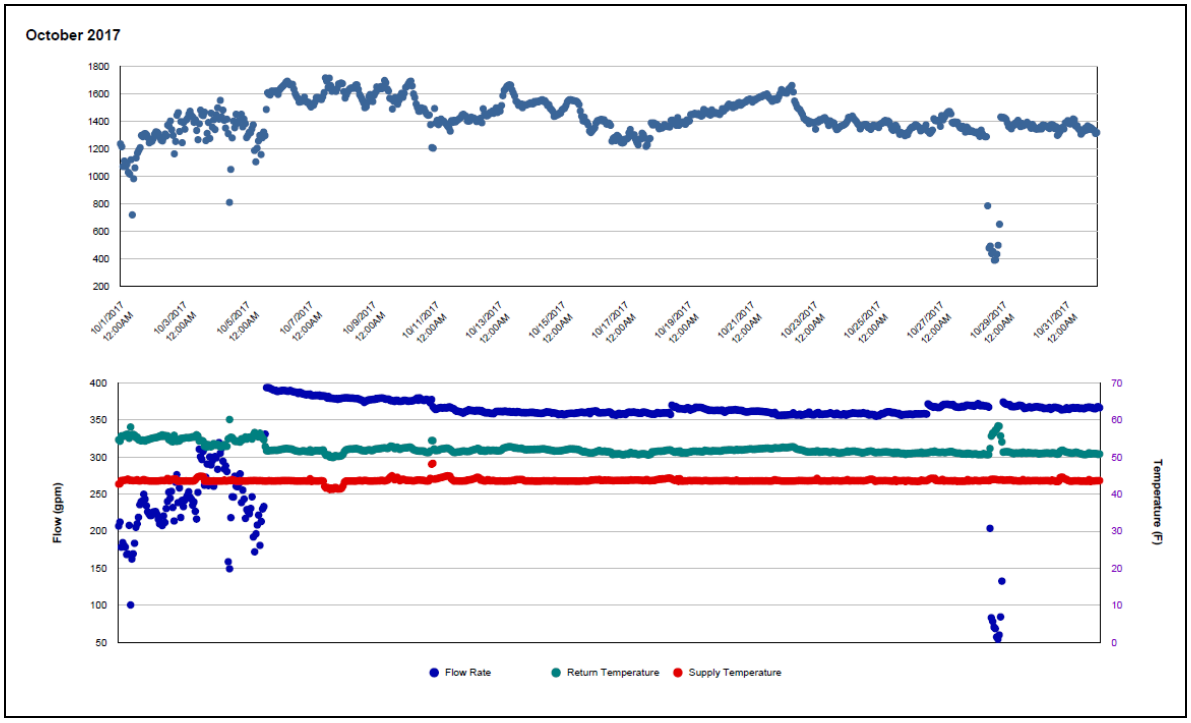
Quantitative descriptions and comments

Both CHW and HHW consumption increased by 50 – 150 Btu/day/ft^2 since 10/1/2017 due to an increase in flow rate. The consumption for whole month was estimated by a model.

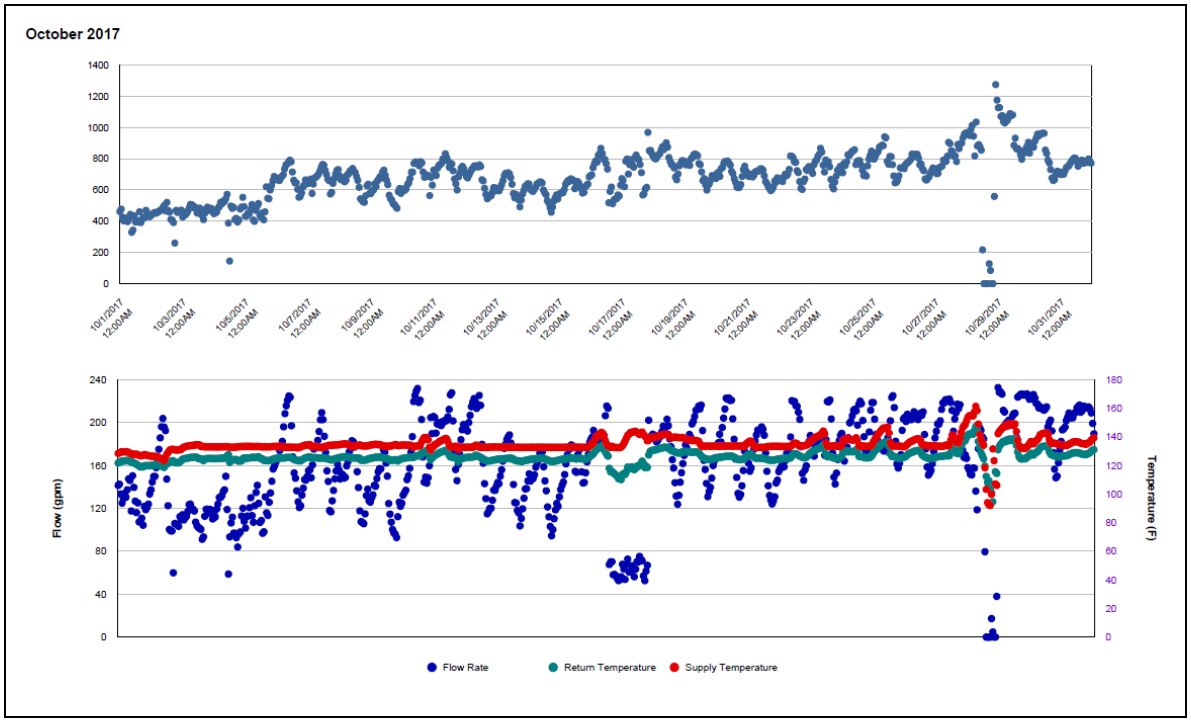
Explanatory Figure: 13 months energy balance plot with original data.



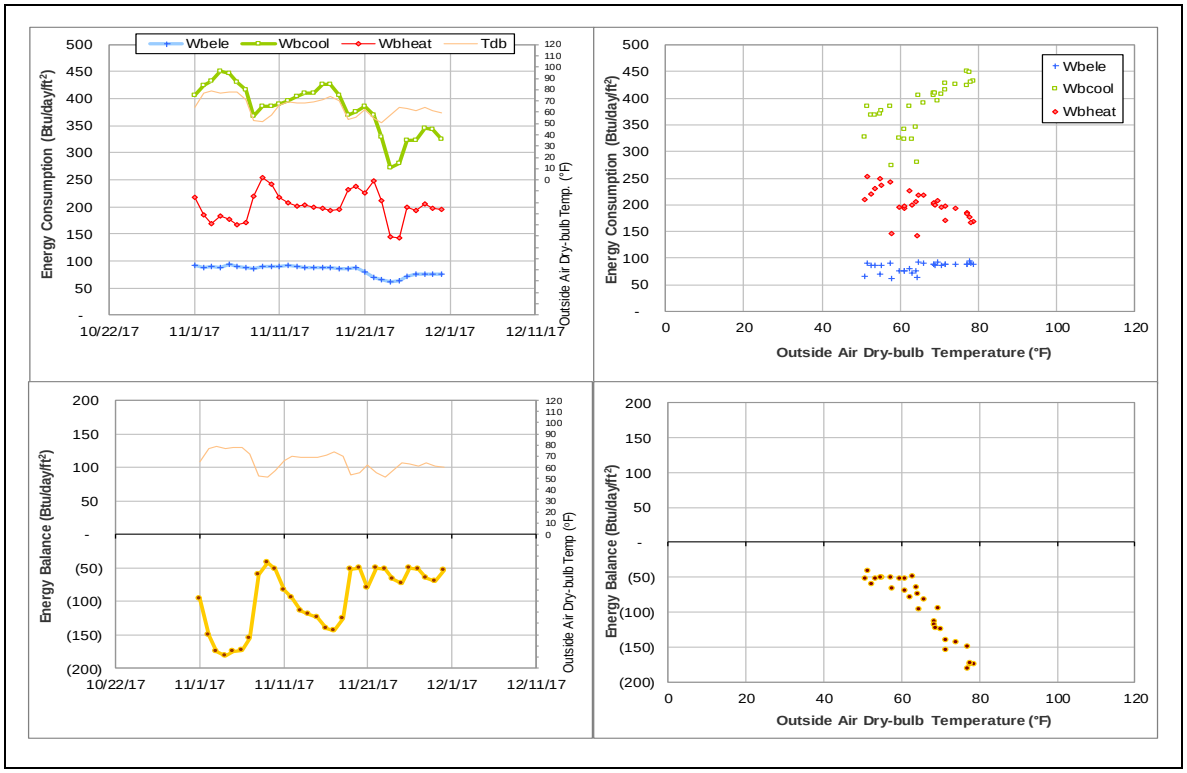
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office (CHW meter during October 2017)



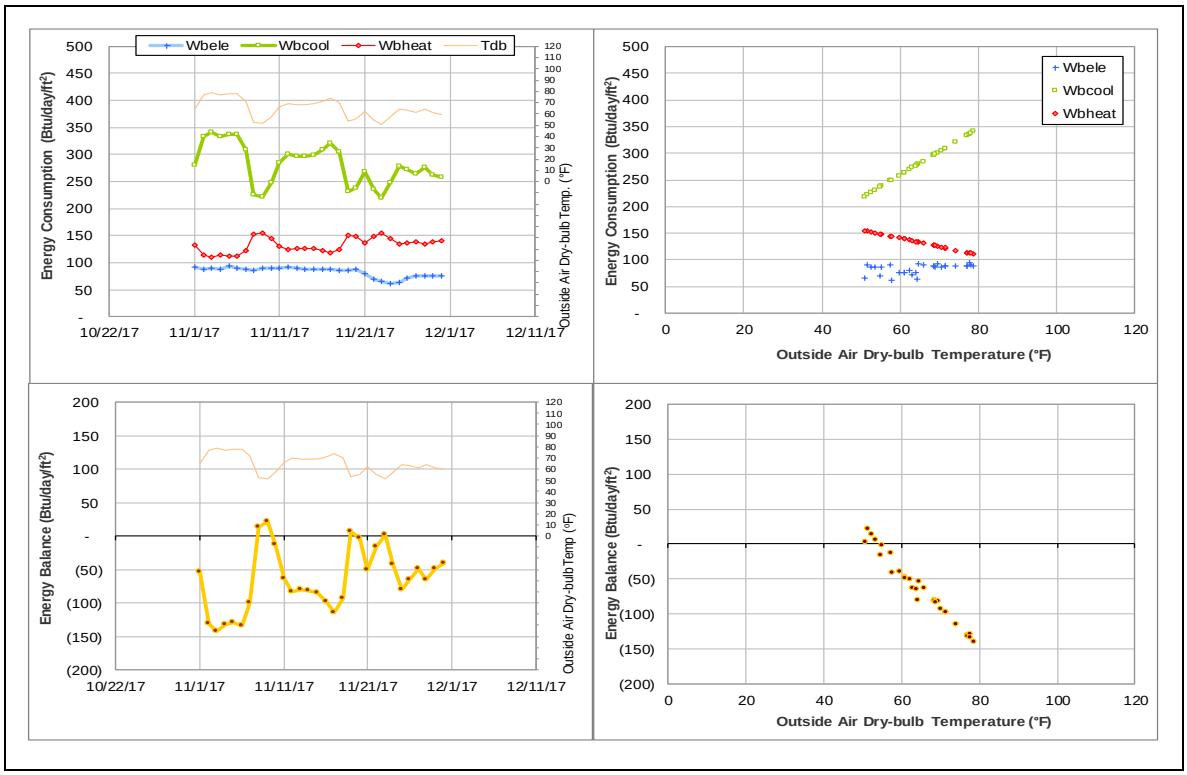
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office (HHW meter during October 2017)



Energy balance plot using the original data for the month of analysis. Missing data have been filled in, if any.



Energy balance plot using the estimated data for the month of analysis.



Kyle Field (TAMU Bldg #367)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
HHW	008027	30	11/1/2017 – 11/30/2017	Model

Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
HHW	The consumption level has decreased suddenly.	10/1/2017– Ongoing

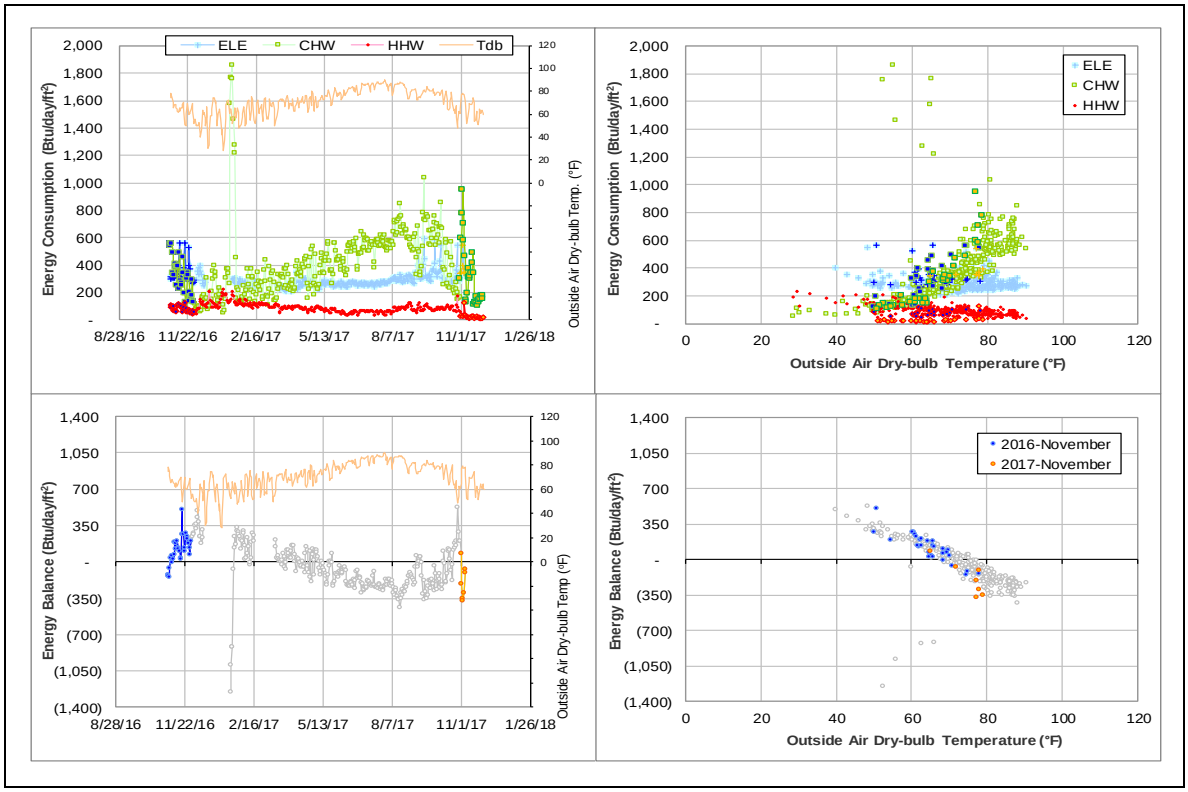
Changes in sensor readings related to the detected issues

Energy Type	Meter ID	Period	Type	Description
HHW	008027	11/1/2017– Ongoing	Flow rate	Decreased largely

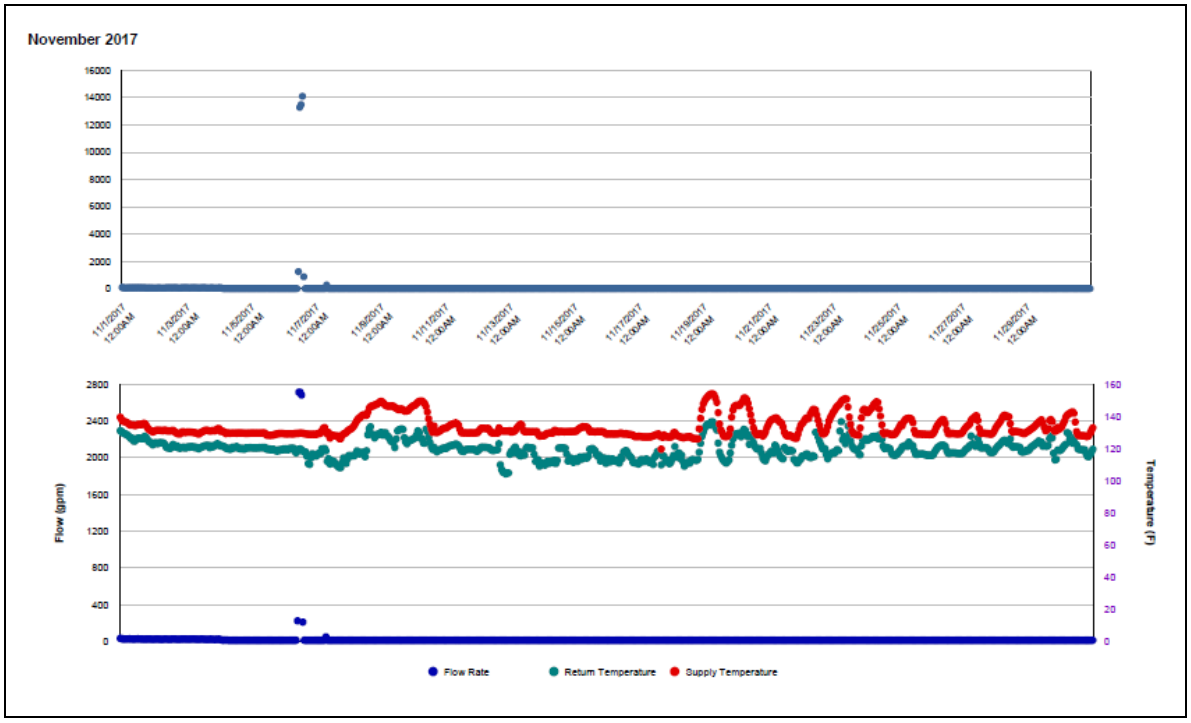
Quantitative descriptions and comments

HHW consumption suddenly decreased by over 50% this month possibly caused by a large decrease in flow rate. The consumption for whole month was estimated by a model.

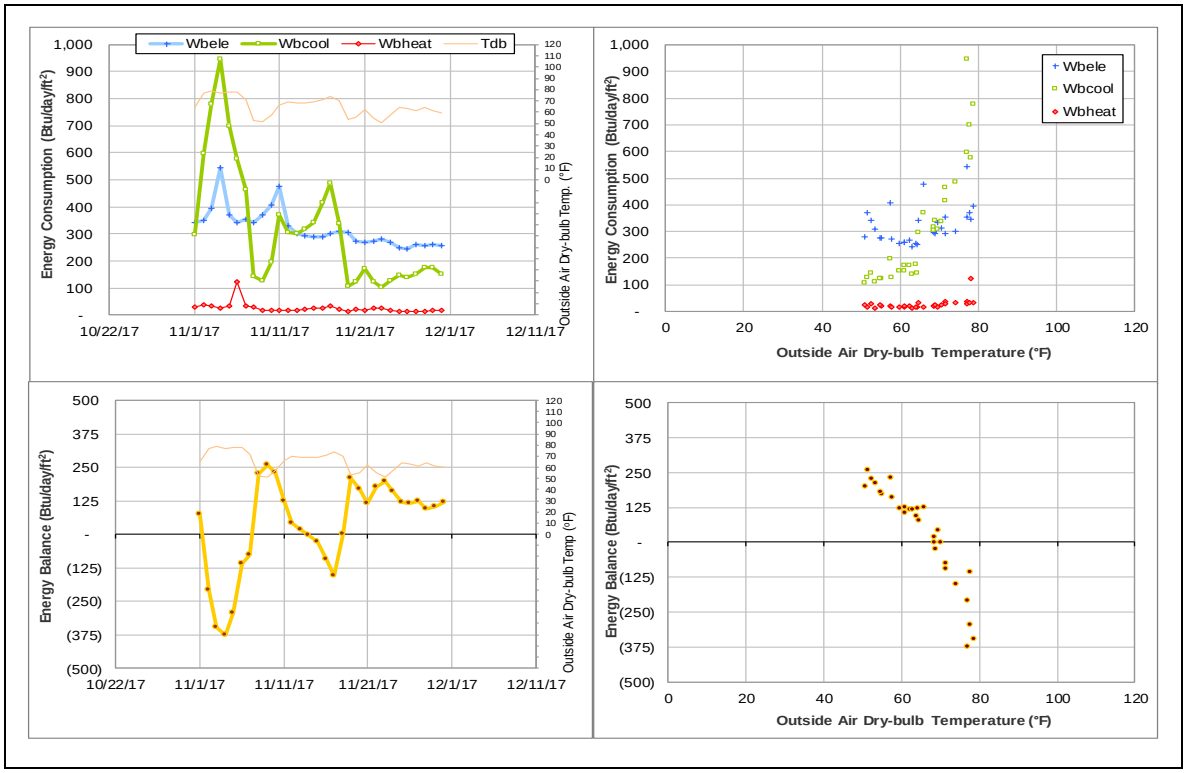
Explanatory Figure: 13 months energy balance plot with original data.



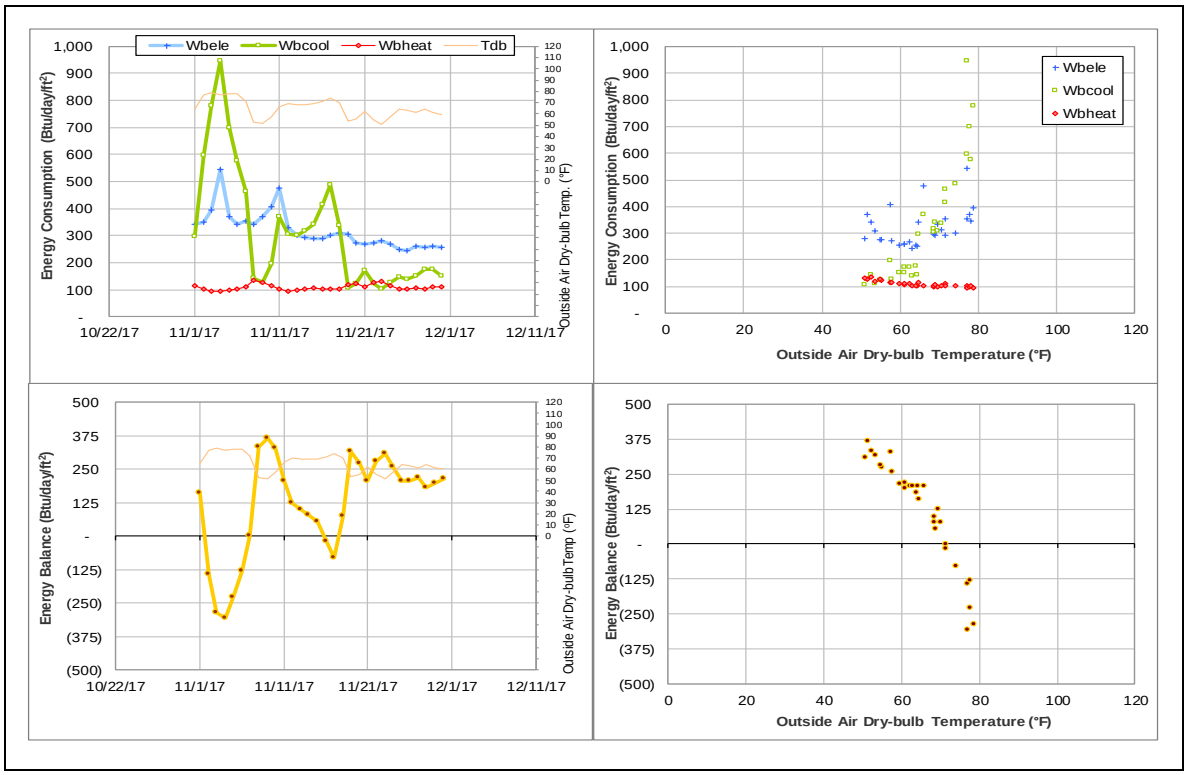
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office (HHW meter during October 2017)



Energy balance plot using the original data for the month of analysis. Missing data have been filled in, if any.



Energy balance plot using the estimated data for the month of analysis.



Jack E. Brown Chemical Engineering Building (TAMU Bldg #386)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
CHW	002250	13	11/1/2017 – 11/13/2017	Model
HHW	002254	30	11/1/2017 – 11/30/2017	Model

Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
CHW	The consumption increased for a short period. The metered values appear to be faulty.	10/10/2017 – 11/13/2017
HHW	The consumption level is lower than the level during the past year.	11/1/2017– Ongoing

Changes in sensor readings related to the detected issues

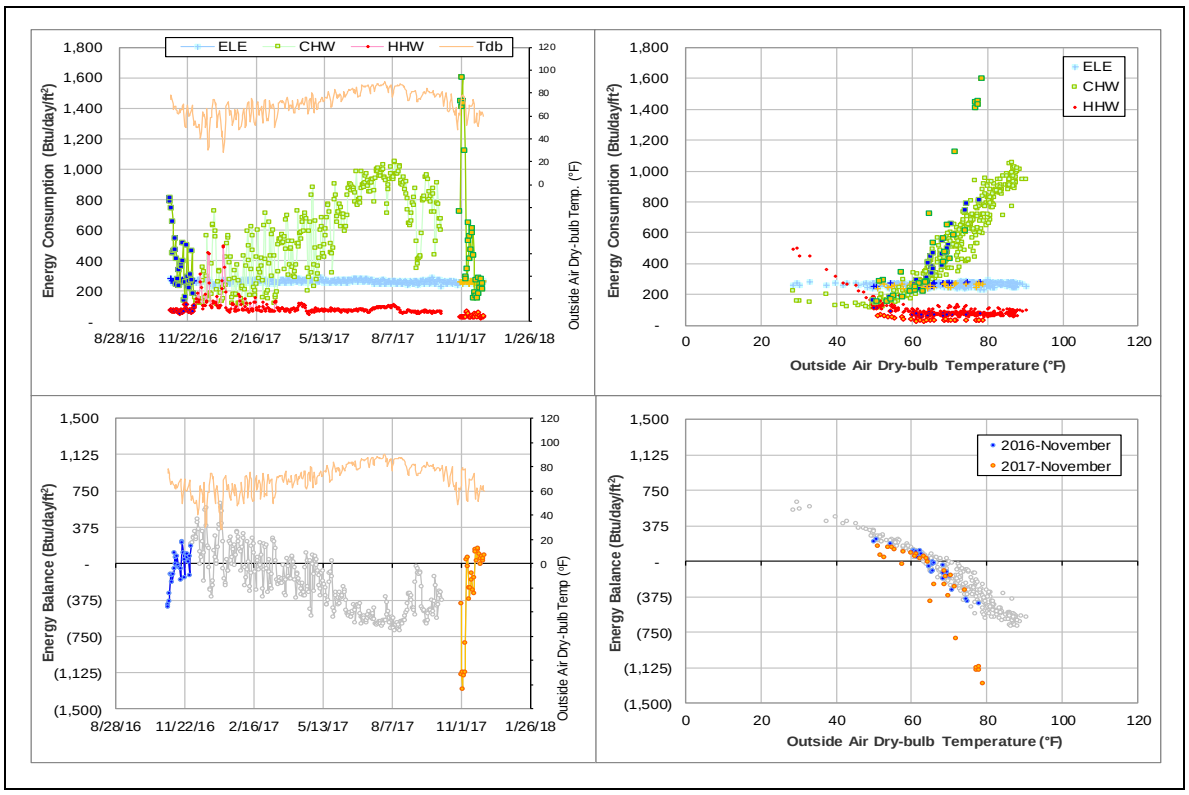
Energy Type	Meter ID	Period	Type	Description
CHW	002250	10/10/2017 – 11/13/2017	Supply temperature	Faulty
HHW	002254	11/1/2017– Ongoing	Flow rate	Decreased

Quantitative descriptions and comments

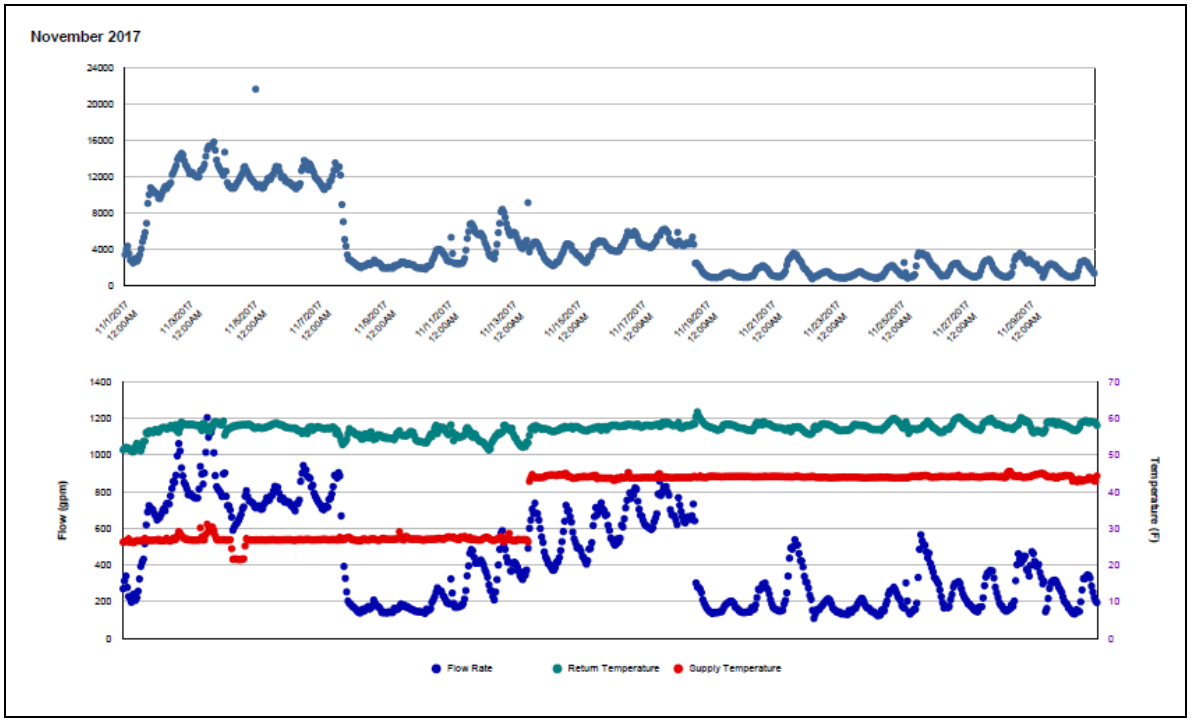
The CHW supply temperature decreased to around 25°F since 10/10/2017 and it increased back to around 43°F on 11/14/2017. The metered value was faulty. The faulty consumption was estimated by a model.

HHW consumption decreased by approximately 50% this month possibly caused by a decrease in flow rate. The consumption for whole month was estimated by a model.

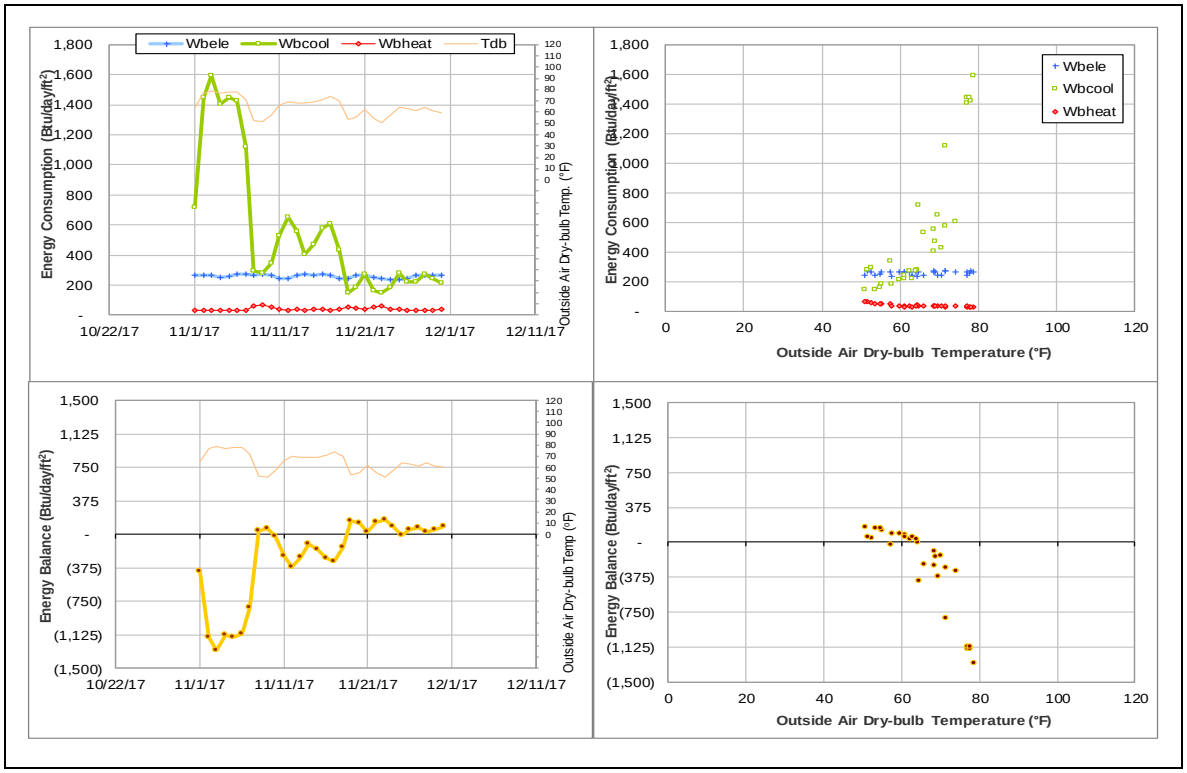
Explanatory Figure: 13 months energy balance plot with original data.



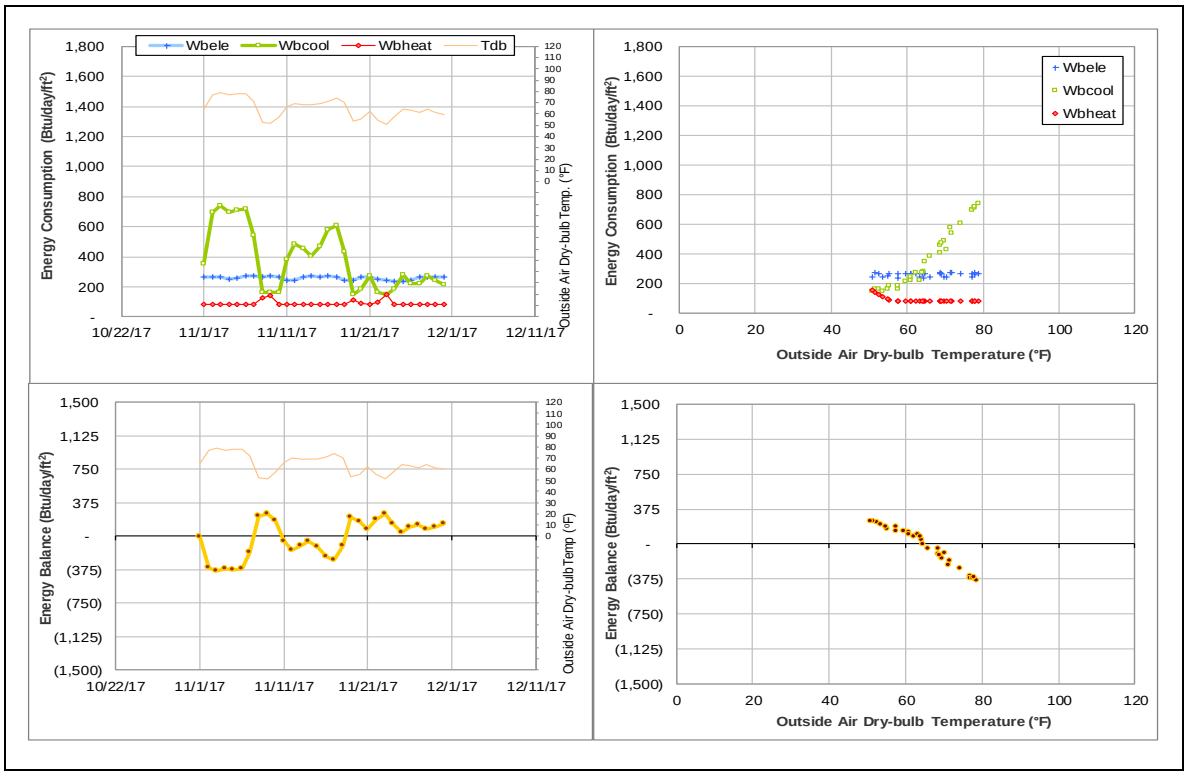
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office (CHW meter during November 2017)



Energy balance plot using the original data for the month of analysis. Missing data have been filled in, if any.



Energy balance plot using the estimated data for the month of analysis.



Gainer Hall Dorm 5 (TAMU Bldg #404)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
HHW	009360	17	11/1/2017 – 11/17/2017	Model

Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
HHW	The consumption increased largely and metered value appeared to be faulty.	10/23/2017 – 11/17/2017

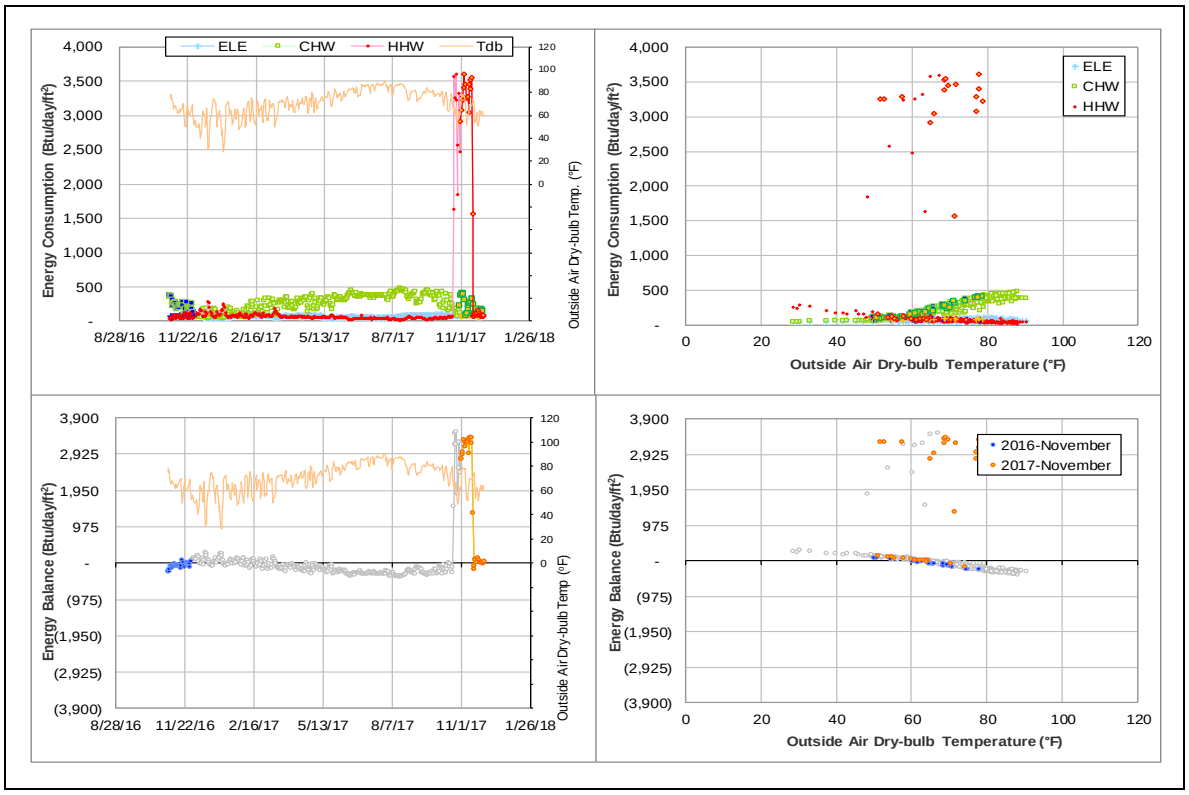
Changes in sensor readings related to the detected issues

Energy Type	Meter ID	Period	Type	Description
HHW	009360	10/23/2017 – 11/17/2017	Flow rate	Increased and maintained at a constant value

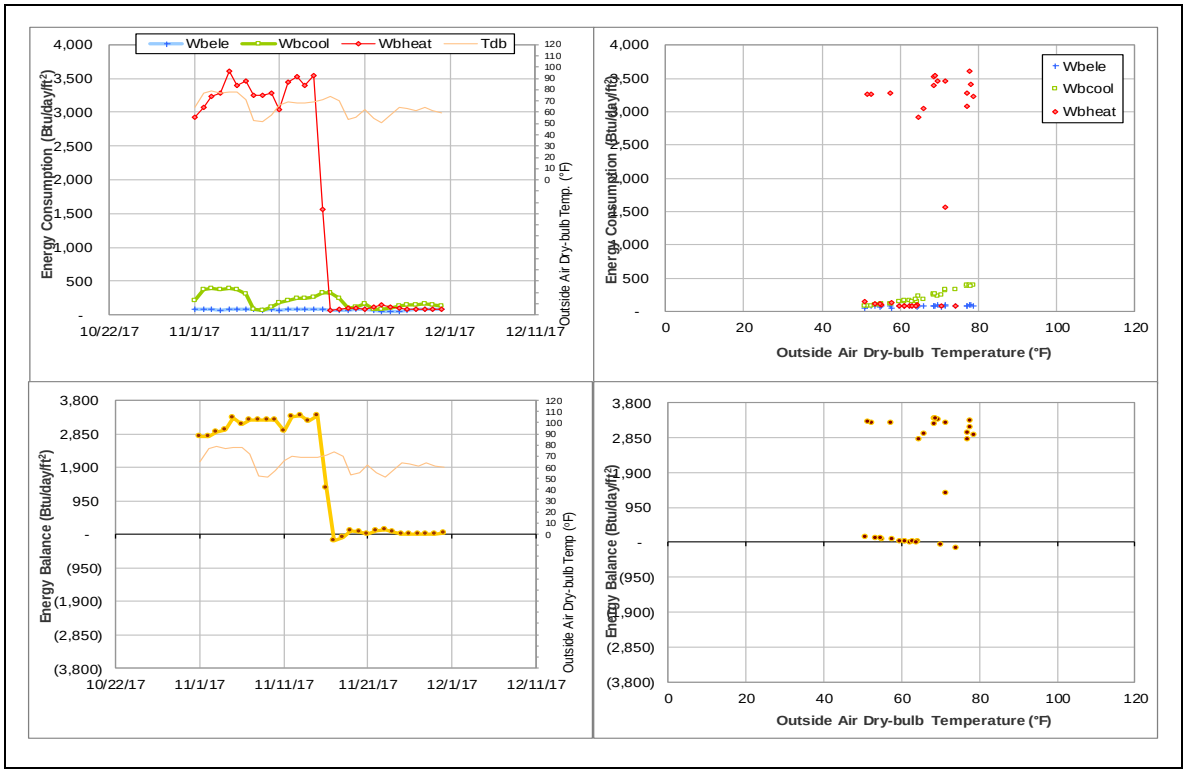
Quantitative descriptions and comments

The HHW increased to extremely high level, ~ 1500 – 3600 Btu/day/ft^2 during 10/23/2017 – 11/17/2017. Flow rate increased and maintained at a constant value during this period. The consumption was estimated by a model.

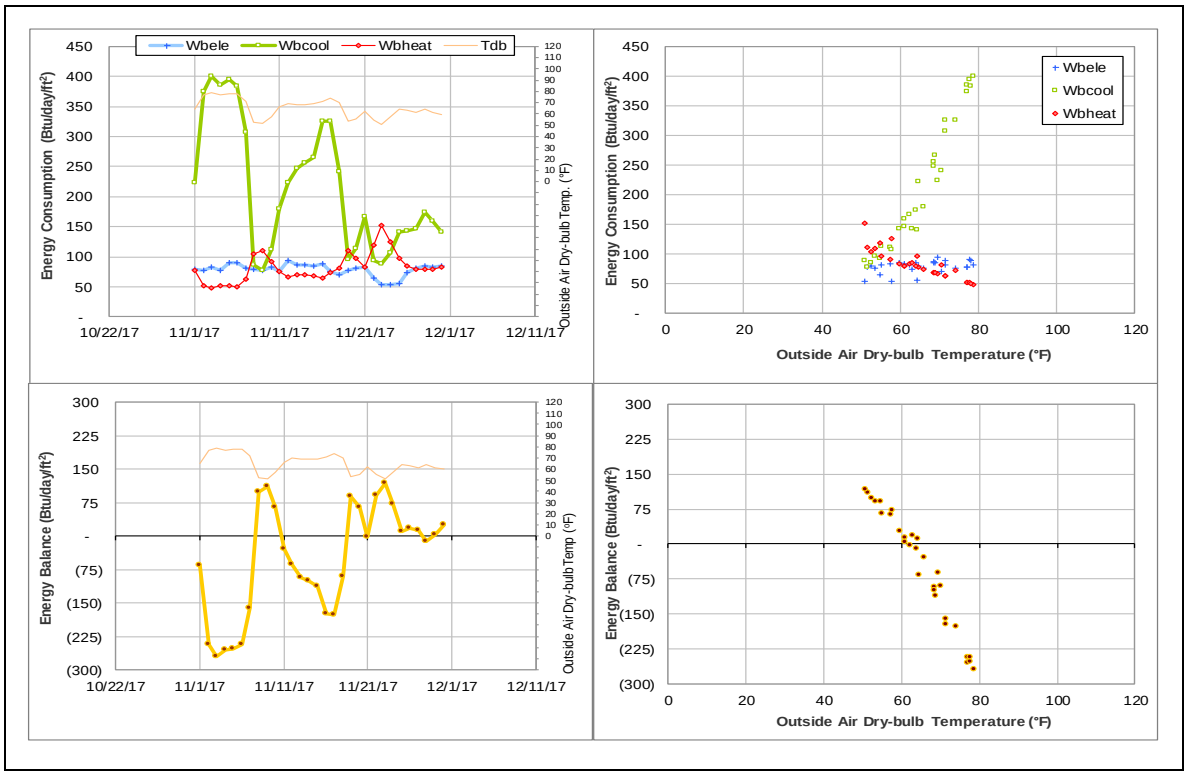
Explanatory Figure: 13 months energy balance plot with original data.



Energy balance plot using the original data for the month of analysis. Missing data have been filled in, if any.



Energy balance plot using the estimated data for the month of analysis.



Harrington Education Center Office Tower (TAMU Bldg #435)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
HHW	002796	14	11/1/2017 – 11/9/2017, 11/17/2017 – 11/21/2017	Model

Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
HHW	The consumption dropped for a short period.	10/4/2017 – 11/9/2017, 11/17/2017 – 11/21/2017

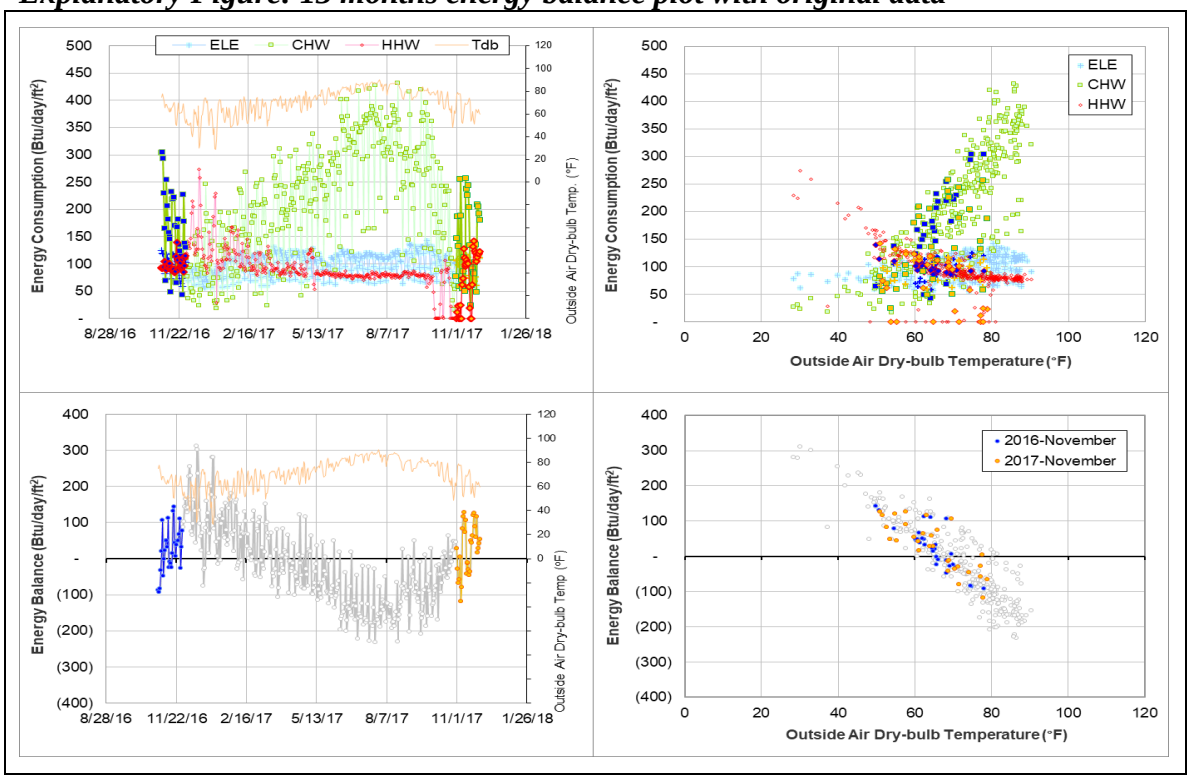
Changes in sensor readings related to the detected issues

Energy Type	Meter ID	Period	Type	Description
HHW	002796	10/4/2017 – 11/9/2017, 11/17/2017 – 11/21/2017	Flow rate	Decreased to zero

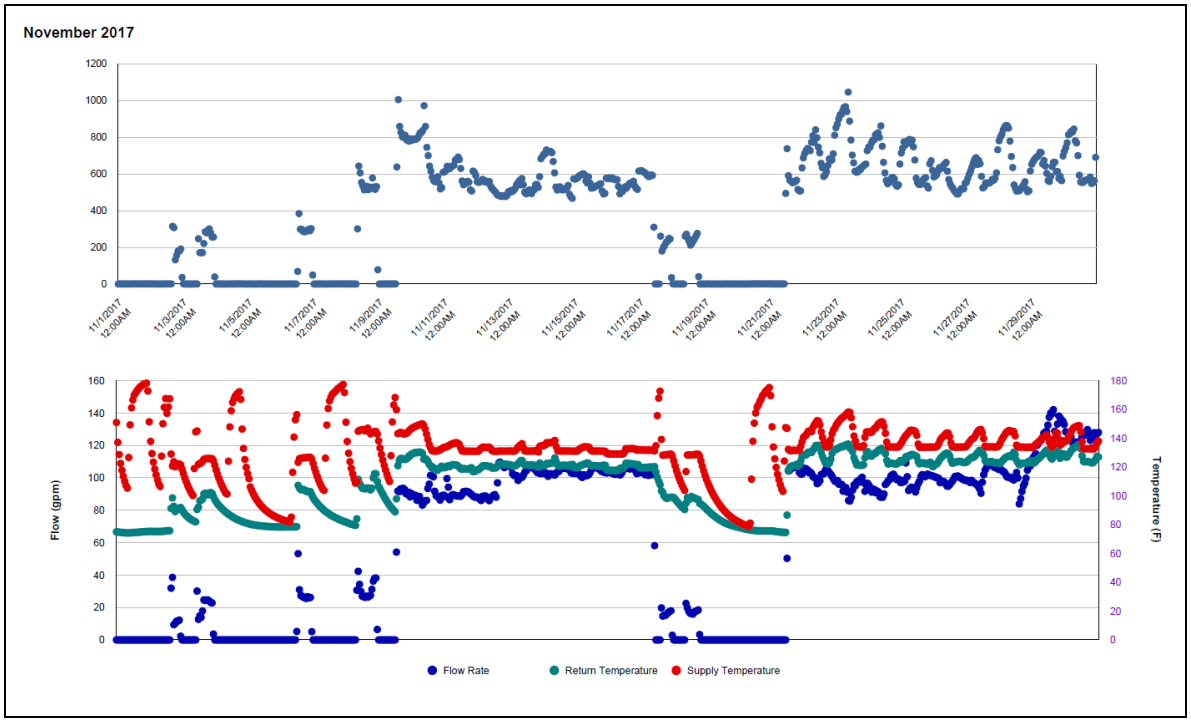
Quantitative descriptions and comments

The HHW consumption decreased to zero during two different periods in November, similar as October. This decrease appears to be related to the flow rate reducing to zero. The HHW consumption for these periods was estimated by model.

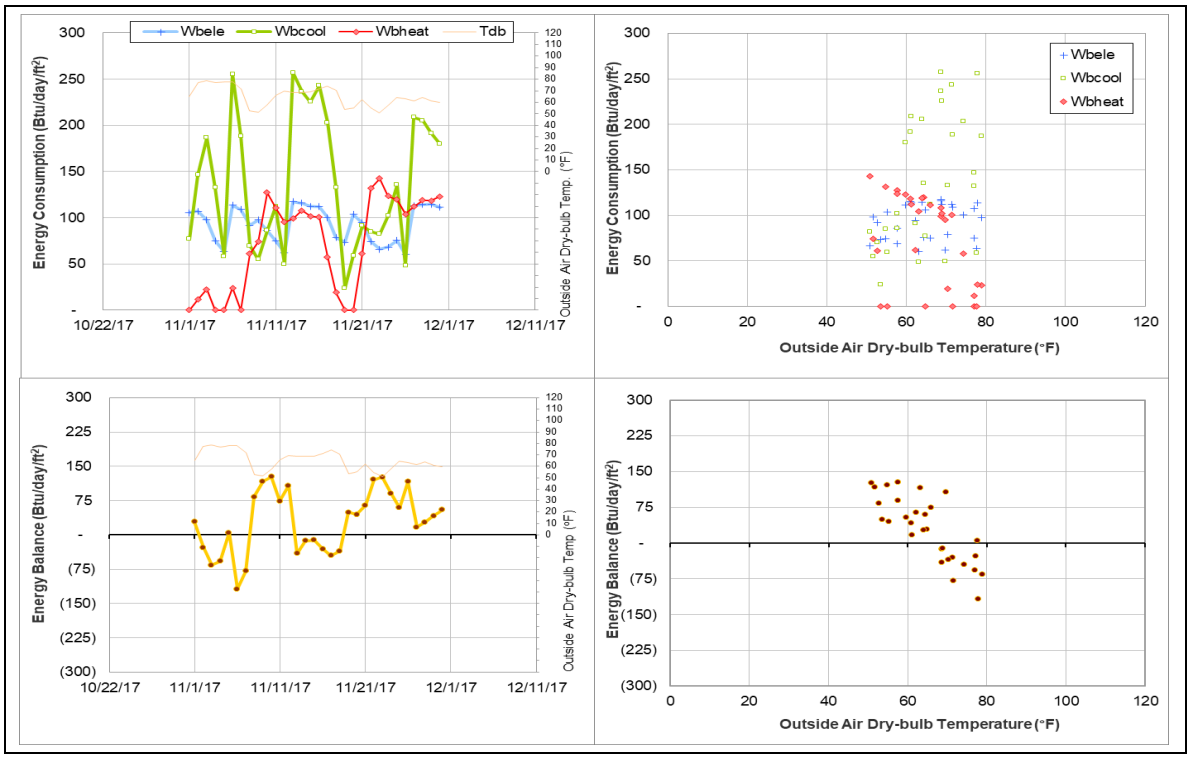
Explanatory Figure: 13 months energy balance plot with original data



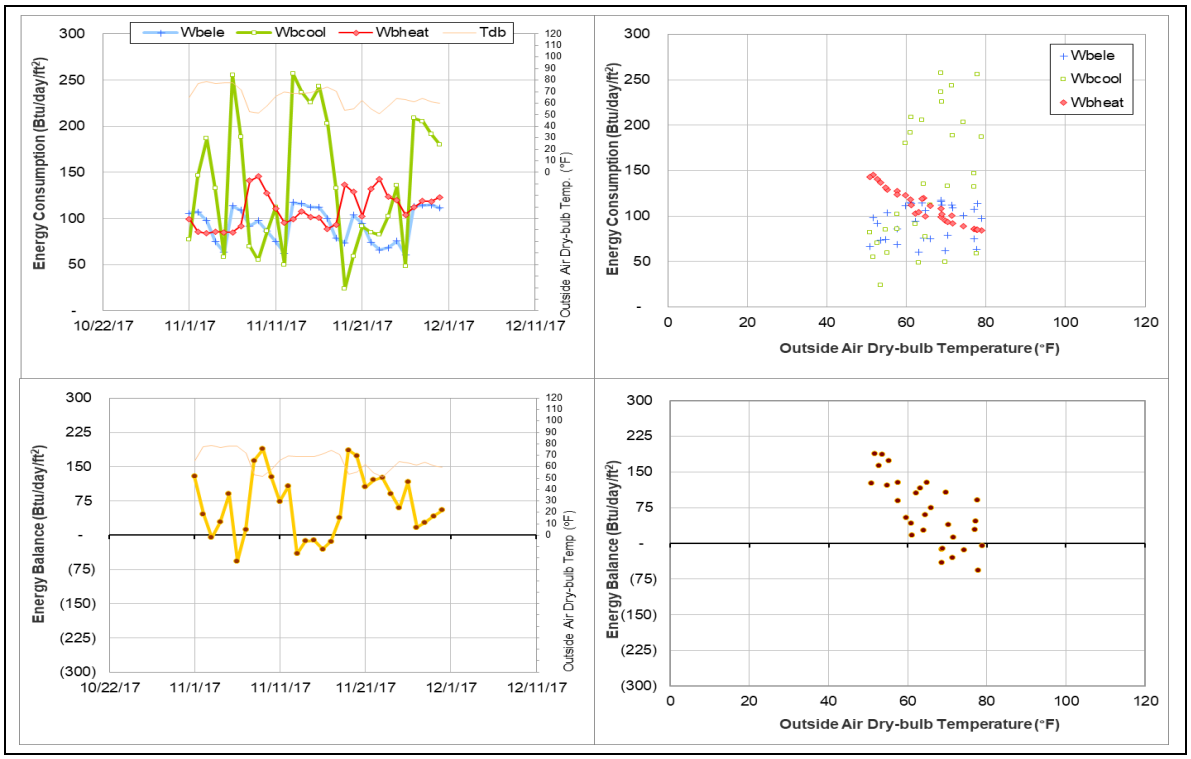
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office (HHW meter during November 2017)



Energy balance plot using the original data for the month of analysis. Missing data have been filled in, if any.



Energy balance plot using the estimated data for the month of analysis



Krueger Residence Hall (TAMU Bldg #441)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
CHW	002504	30	11/1/2017 – 11/30/2017	Model
HHW	002500	30	11/1/2017 – 11/30/2017	Calculated using hourly flow rate and Delta-T

Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
CHW	The metered values appear to be faulty.	9/22/2017 – Ongoing
HHW	The metered values appear to be faulty.	9/22/2017 – Ongoing

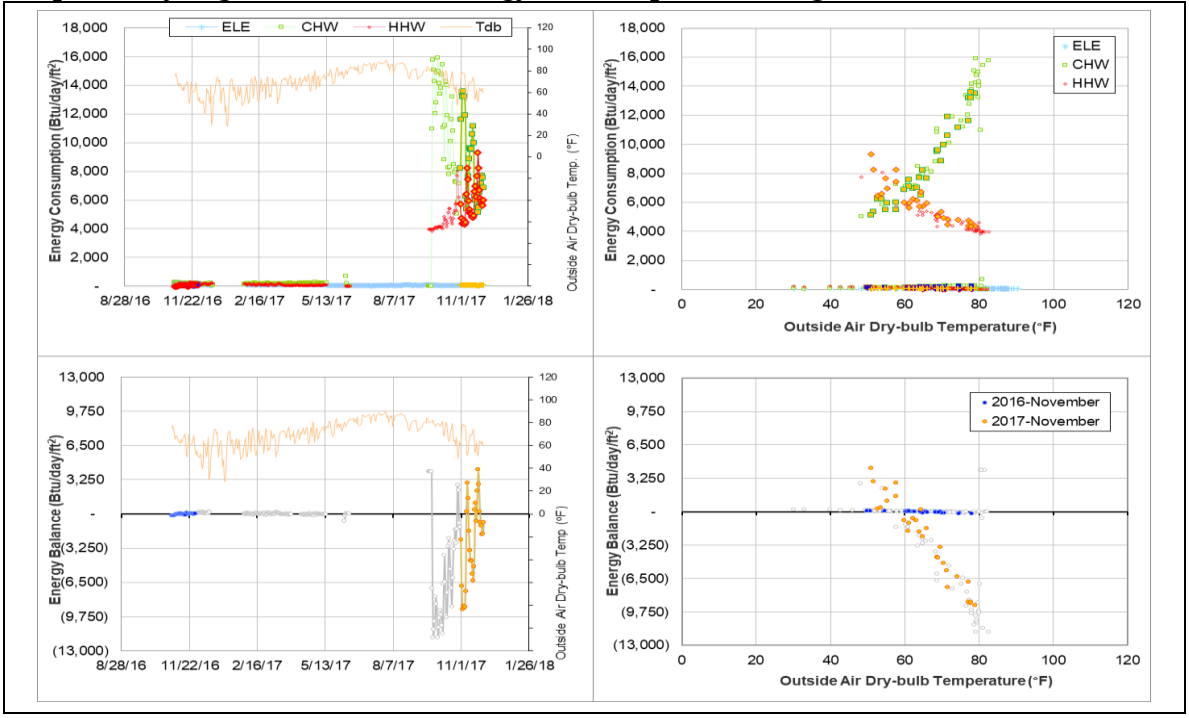
Changes in sensor readings related to the detected issues

Energy Type	Meter ID	Period	Type	Description
CHW	002504	9/22/2017 – Ongoing	Energy calculation	Faulty
HHW	002500	9/22/2017 – Ongoing	Energy calculation	Faulty

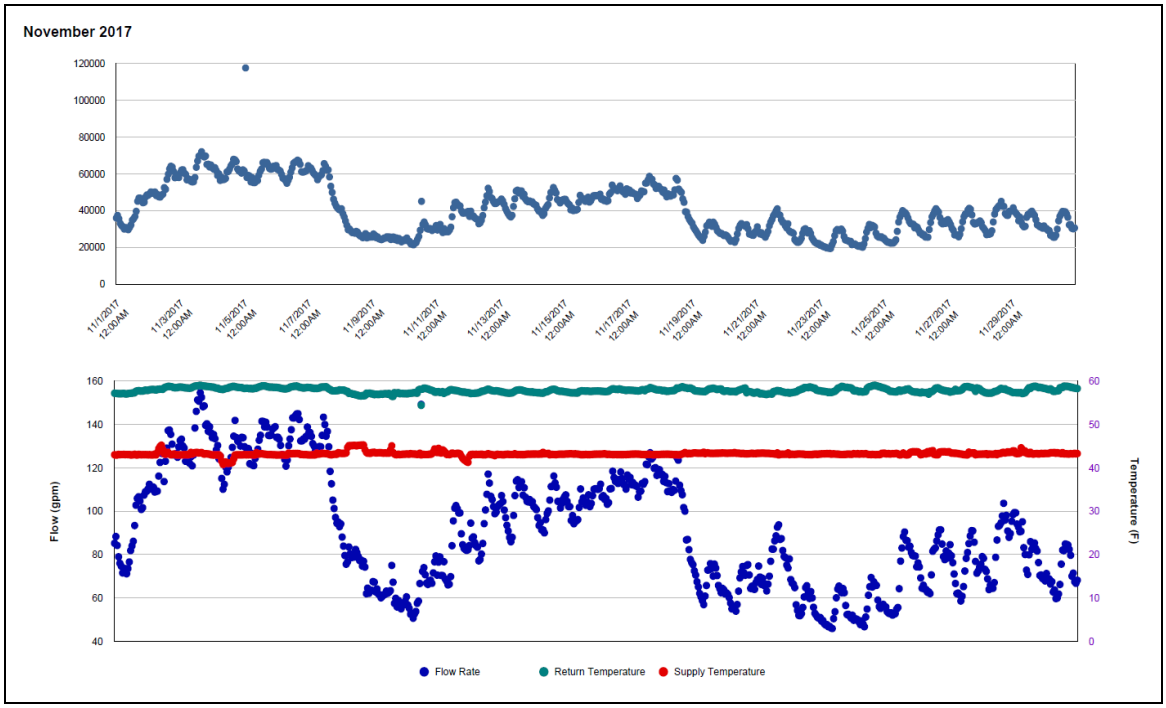
Quantitative descriptions and comments

Krueger Residence Hall underwent HVAC renovation during the summer of 2017. The CHW and HHW meter data returned on 9/22/2017, however the new consumption levels are unreasonably high, 4,000 – 16,000 Btu/day/ft^2 for CHW and 4,000 – 8,000 Btu/day/ft^2 for HHW. When looking at the flow rates and Delta-T's, the calculated energy at the meters are higher than expected. The CHW consumption was estimated by model using a baseline period prior to renovation because the flow rate and delta-T from ION EEM is not available. The HHW consumption was calculated using the hourly flow rate and Delta-T from ION EEM.

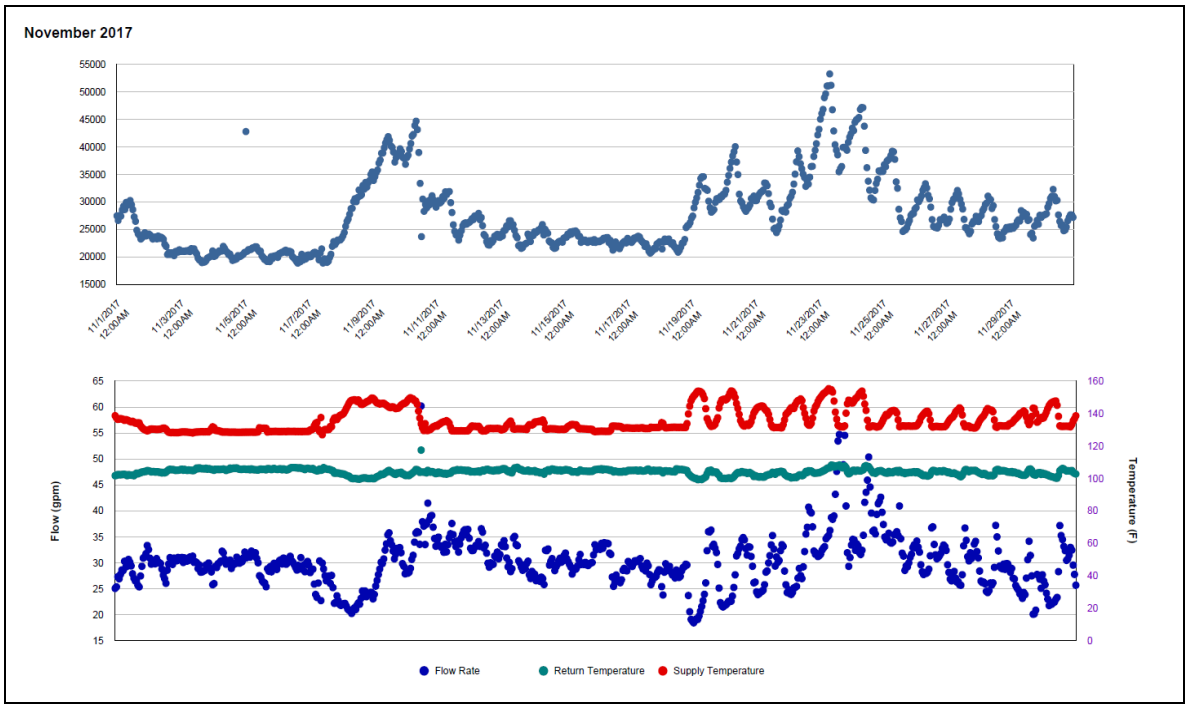
Explanatory Figure: 13 months energy balance plot with original data



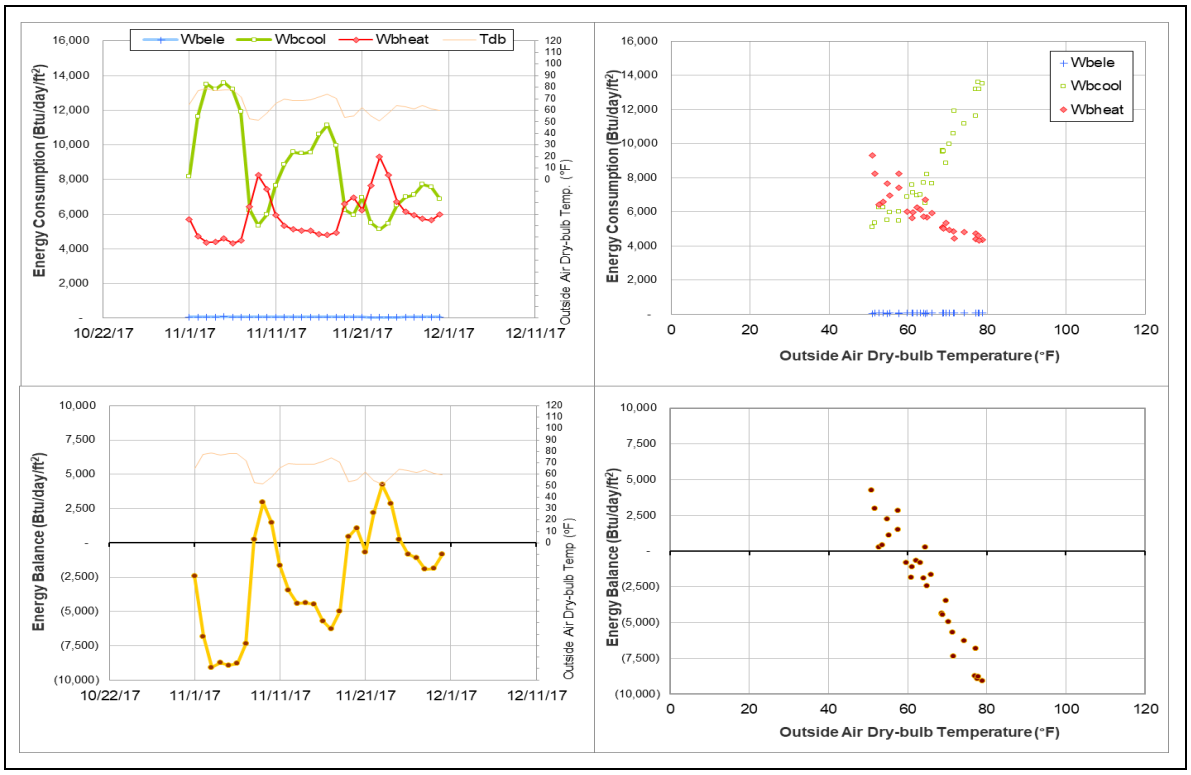
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office (CHW meter during November 2017)



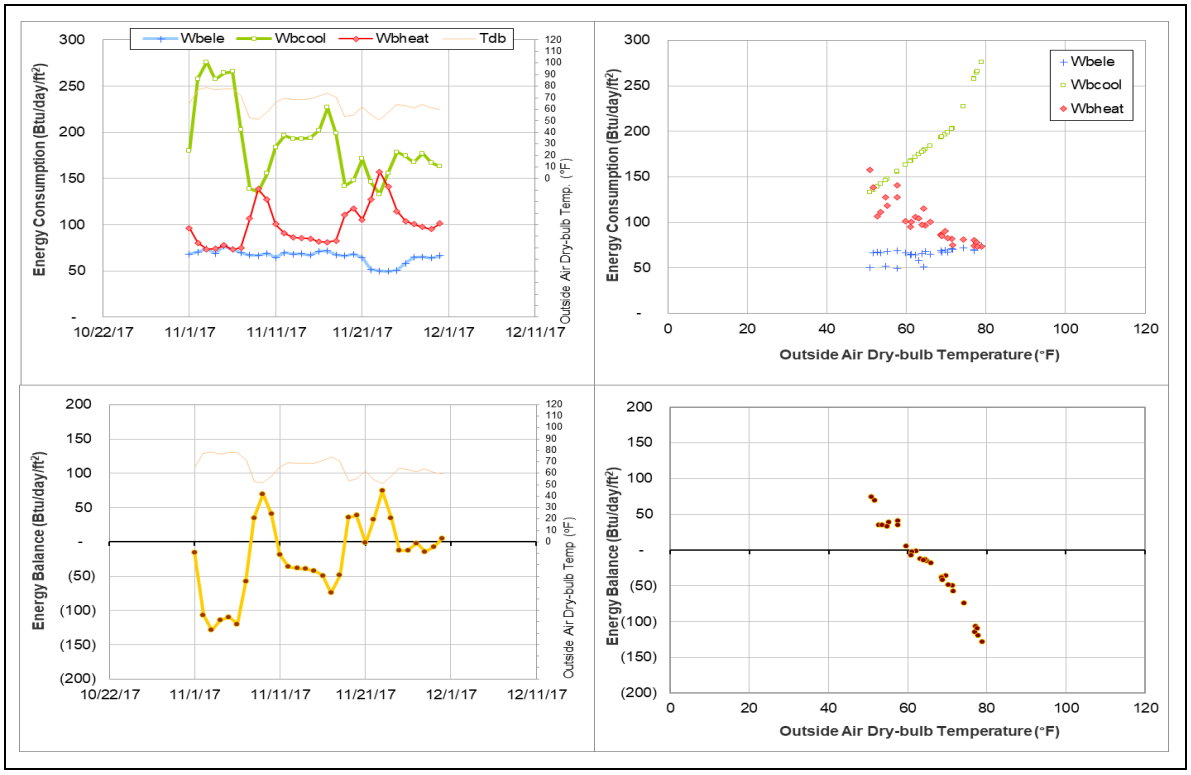
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office (HHW meter during November 2017)



Energy balance plot using the original data for the month of analysis. Missing data have been filled in, if any.



Energy balance plot using the estimated data for the month of analysis



Dunn Residence Hall (TAMU Bldg #442)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
HHW	002515	5	11/17/2017 – 11/21/2017	Model

Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
HHW	The consumption dropped for a short period.	10/13/2017 – 10/17/2017, 11/17/2017 – 11/21/2017

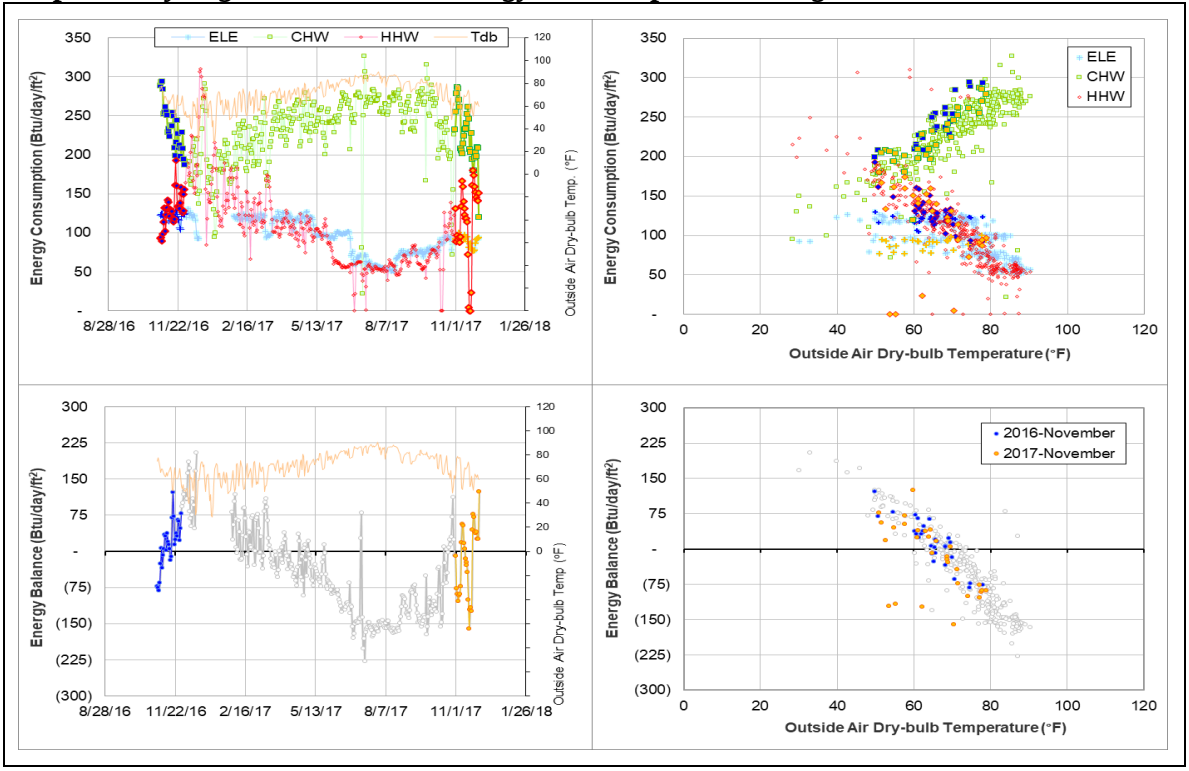
Changes in sensor readings related to the detected issues

Energy Type	Meter ID	Period	Type	Description
HHW	002515	10/13/2017 – 10/17/2017, 11/17/2017 – 11/21/2017	Supply Temp	Decreased, negative Delta-T

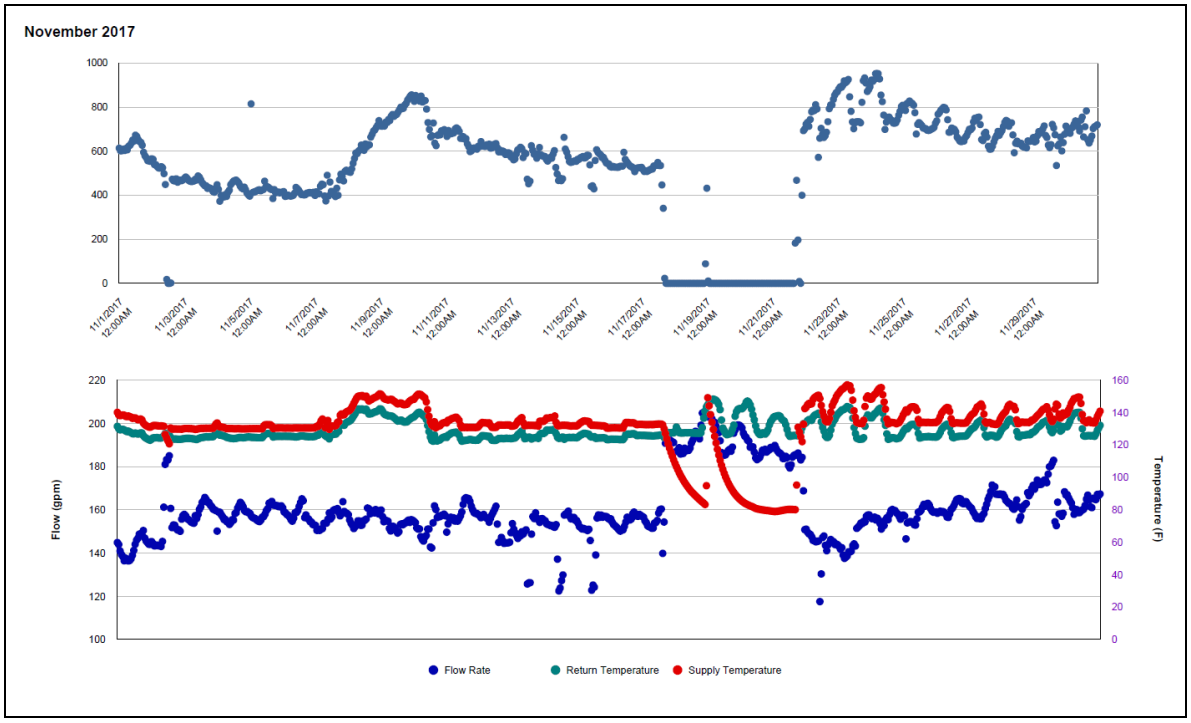
Quantitative descriptions and comments

From 11/17/2017 to 11/21/2017, the HHW supply temperature decreased suddenly causing the Delta-T to become negative, similar to the period in October. The HHW consumption was estimated by model for this period.

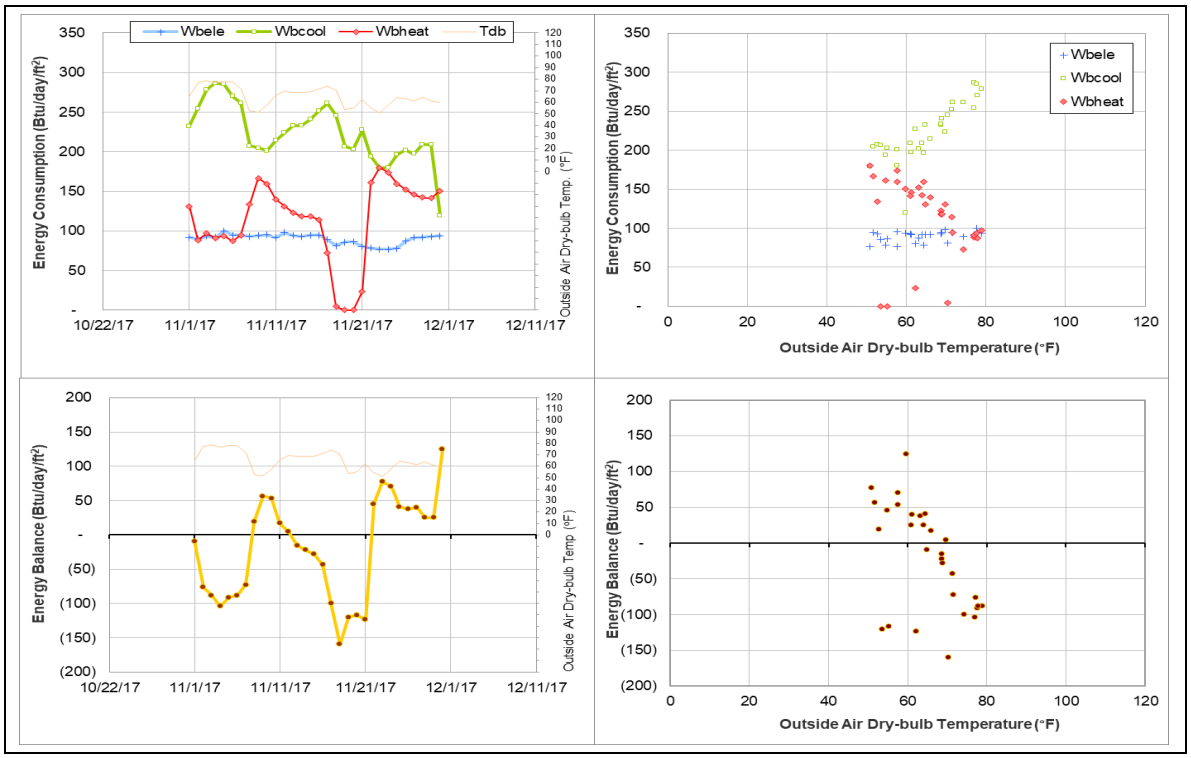
Explanatory Figure: 13 months energy balance plot with original data



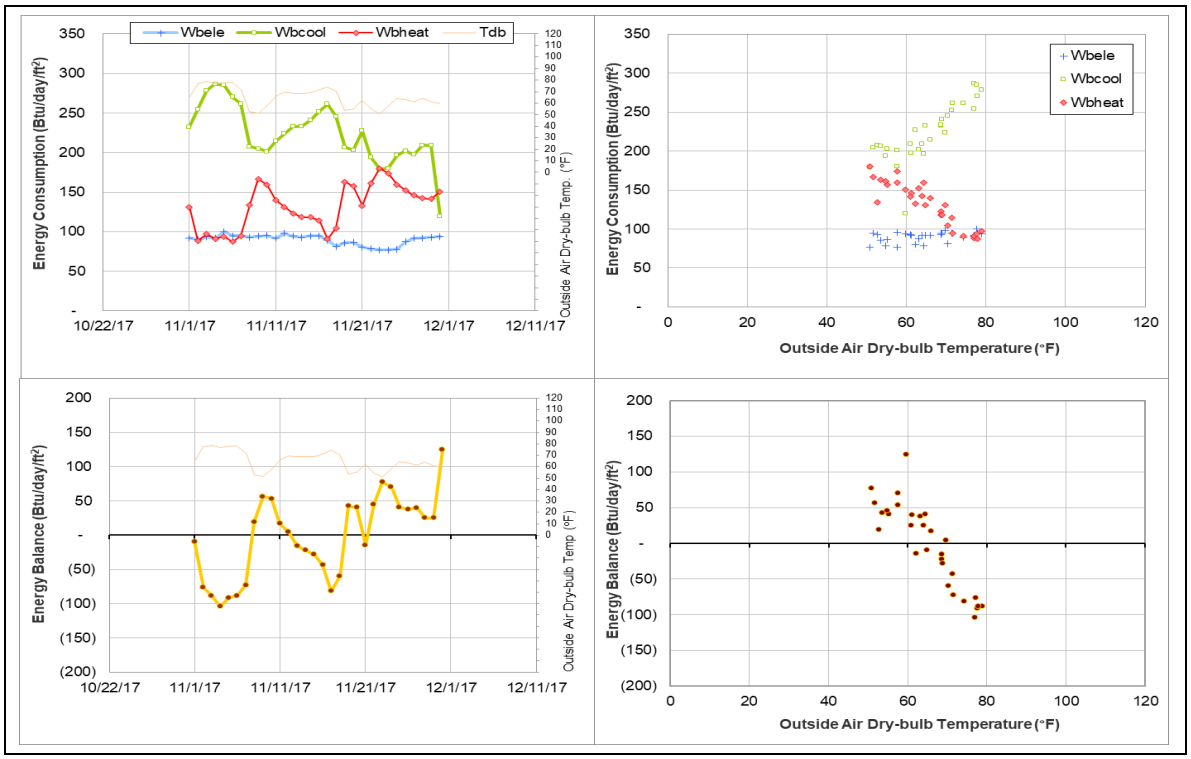
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office (HHW meter during November 2017)



Energy balance plot using the original data for the month of analysis. Missing data have been filled in, if any.



Energy balance plot using the estimated data for the month of analysis



Peterson Building (TAMU Bldg #444)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
CHW	002922	30	11/1/2017 – 11/30/2017	Model

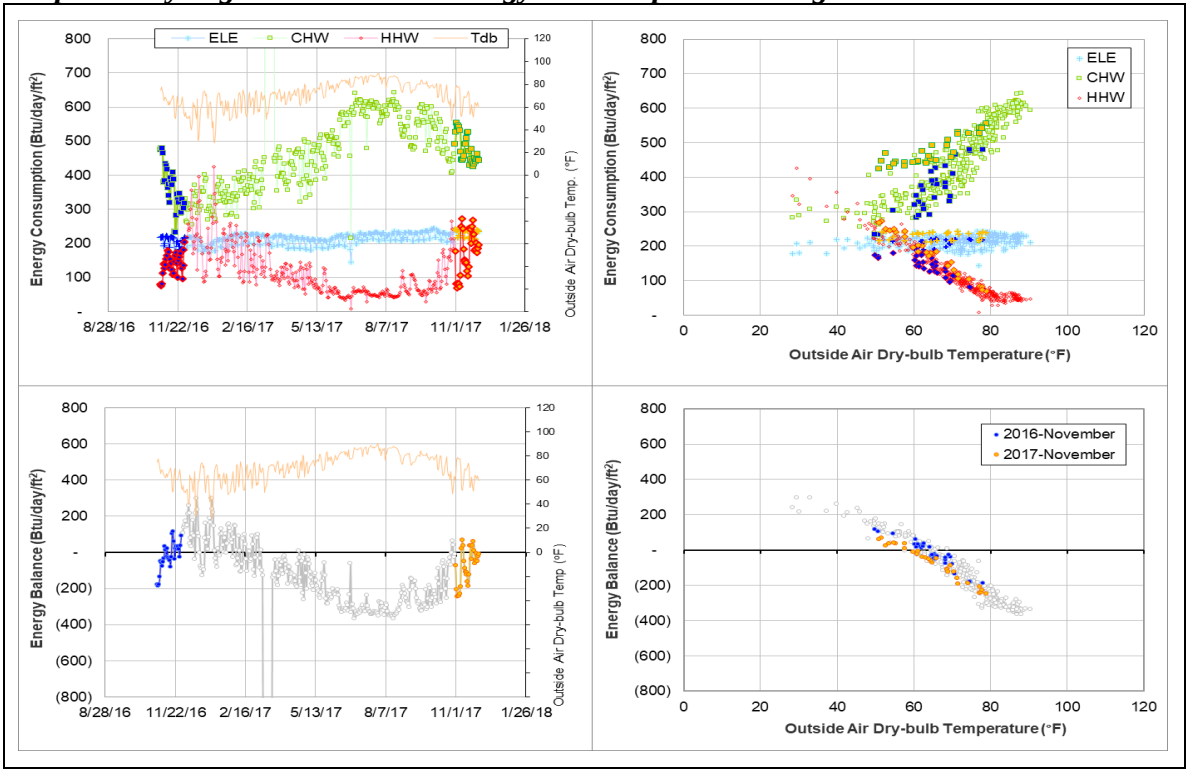
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
CHW	The consumption level is higher than the level during the past year.	10/1/2017 – Ongoing

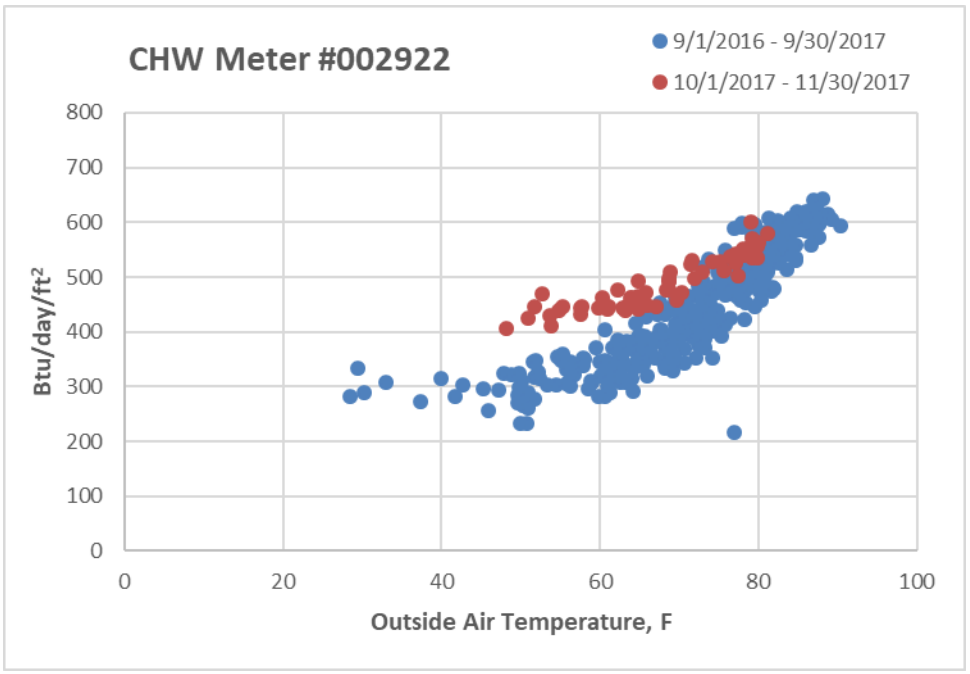
Quantitative descriptions and comments

The CHW consumption pattern started to increase in October 2017. When compared to November 2016, the consumption pattern for this month increased by 50 Btu/day/ft^2 (10%) in warmer temperatures and 130 Btu/day/ft^2 (44%) in cooler temperatures. The energy balance also decreased in the cooler temperature range by 45 – 96 Btu/day/ft^2. The cross-point temperature decreased from 64 °F to 58 °F. No obvious meter issues were detected. The CHW consumption was estimated by model for the month.

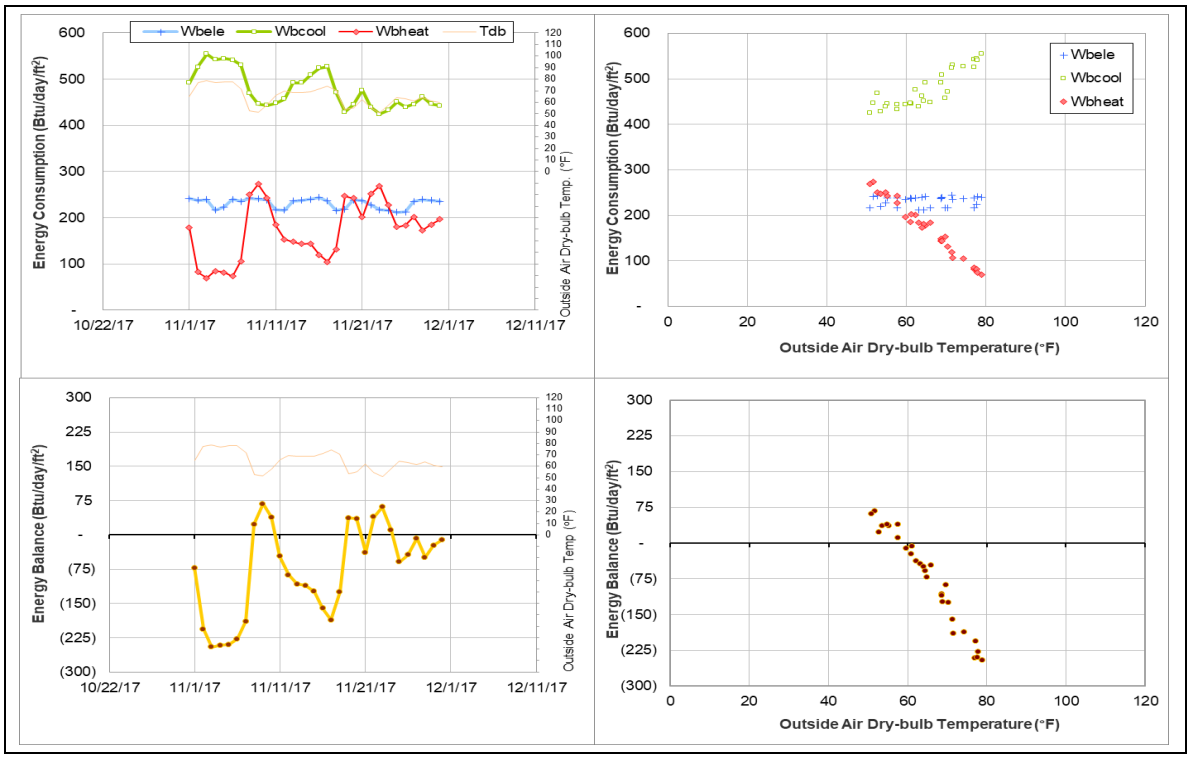
Explanatory Figure: 13 months energy balance plot with original data



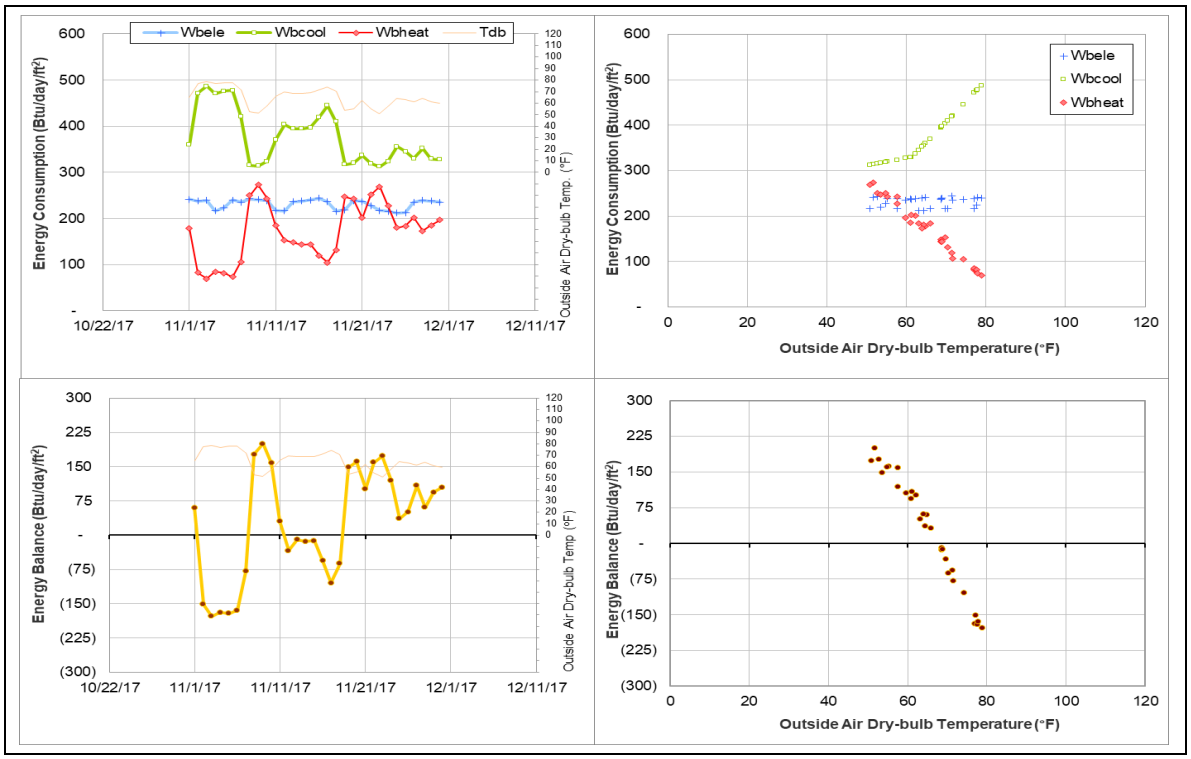
Explanatory Figure: Scatter plot of CHW Meter #002922 versus outside air temperature showing the pattern before and after 10/1/2017.



Energy balance plot using the original data for the month of analysis. Missing data have been filled in, if any.



Energy balance plot using the estimated data for the month of analysis



Rudder Theatre Complex (TAMU Bldg # 446)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
ELE	002977	31	11/1/2017 – 11/30/2017	Model
ELE	002980	31	11/1/2017 – 11/30/2017	Model
CHW	004297	31	11/1/2017 – 11/30/2017	Model
HHW	004309	31	11/1/2017 – 11/30/2017	Model

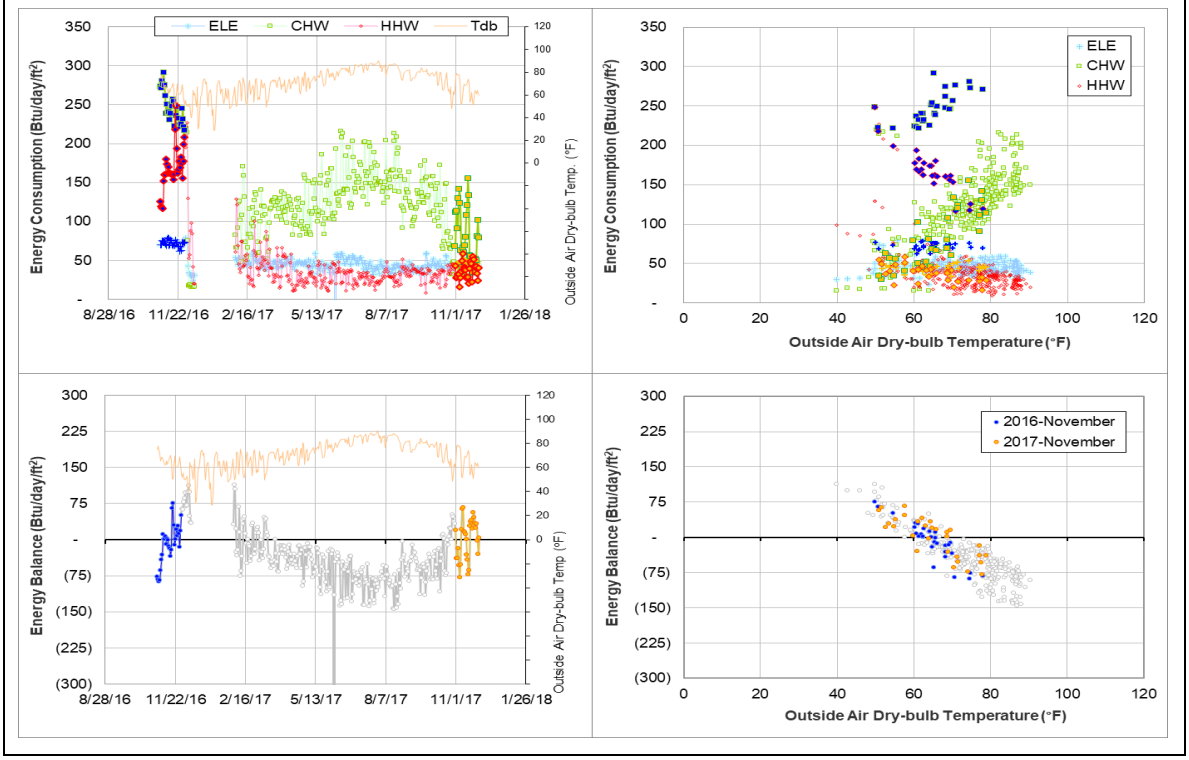
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
ELE	The consumption level has decreased suddenly.	2/1/2017 – Ongoing
ELE	The consumption level has decreased suddenly.	2/1/2017 – Ongoing
CHW	The consumption level has decreased suddenly.	2/1/2017 – Ongoing
HHW	The consumption level has decreased suddenly.	2/1/2017 – Ongoing

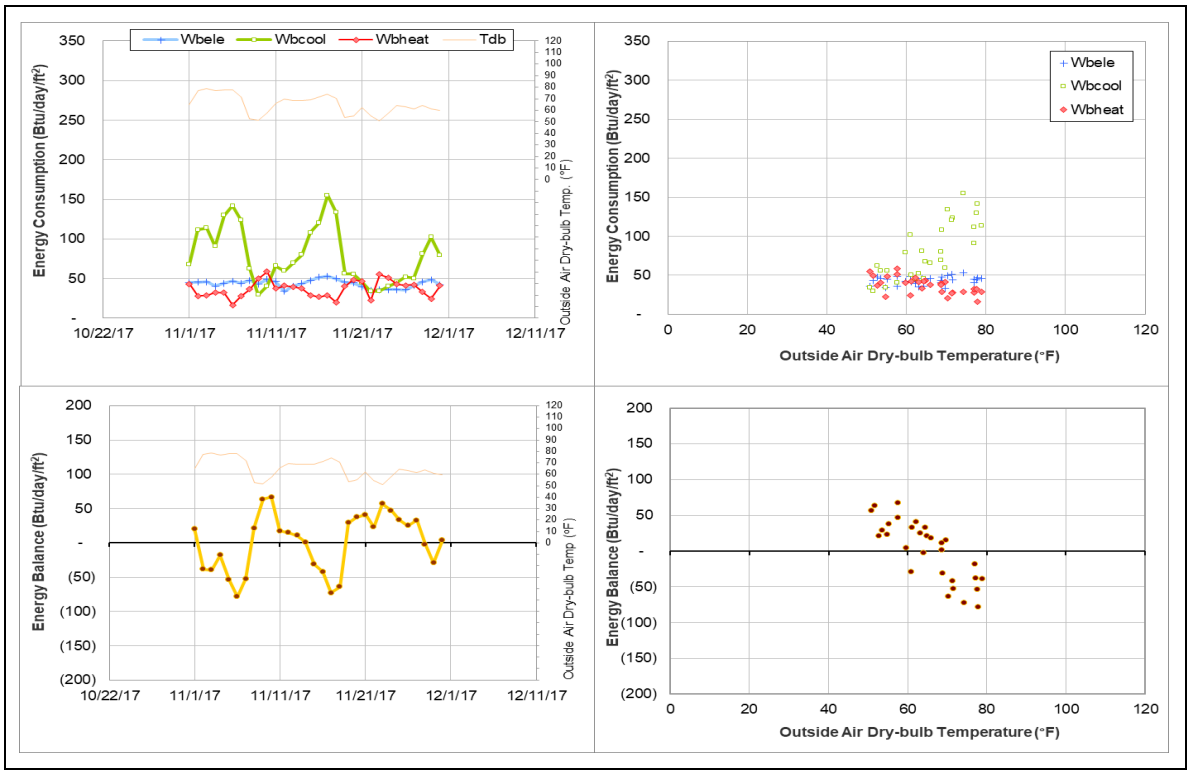
Quantitative descriptions and comments

ELE, CHW, and HHW consumption dropped during the winter break of last year (2016-2017) and again during the winter break in 2015-2016. This drop is not suspected to be a meter malfunction since a decrease would be expected during break periods and that the data from 2015-2016 winter suggests that the consumption went back to the normal level around 1/25/2016. However, the data following 2016-2017 winter has not yet returned to the normal level. The energy balance of this building does not show separate patterns for these two levels. The whole month is estimated using a model for ELE, CHW, and HHW.

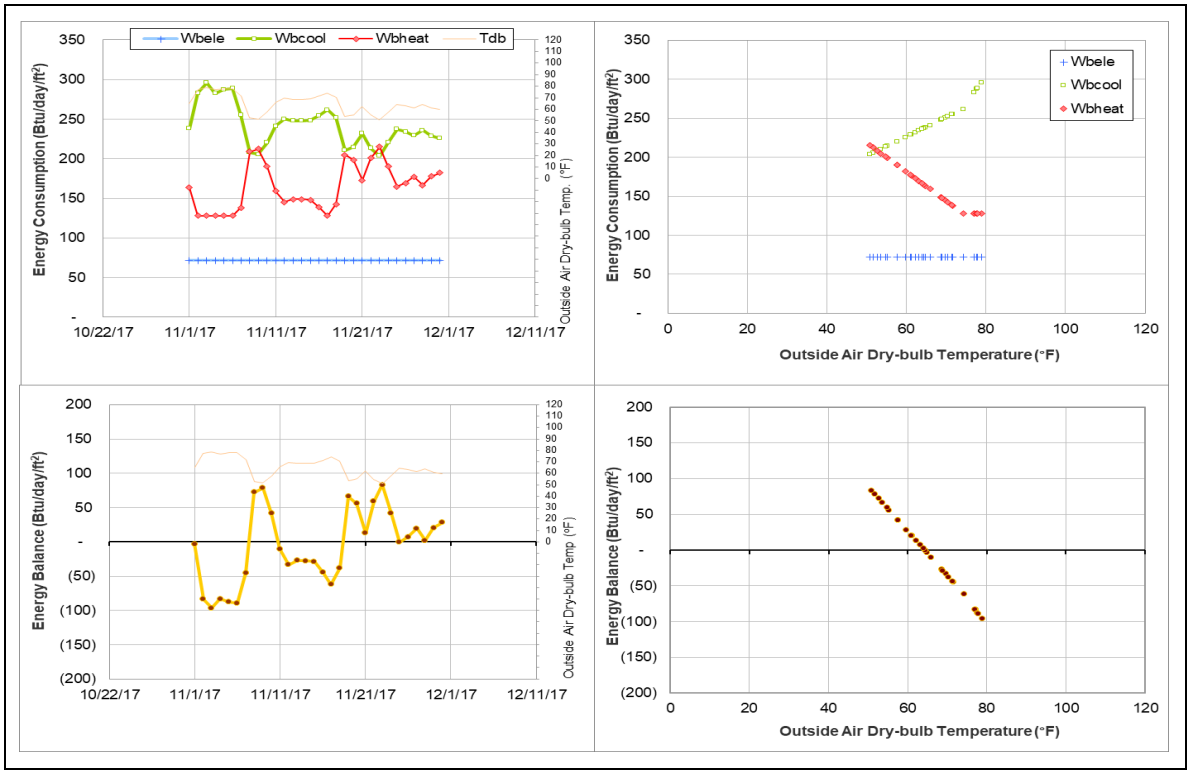
Explanatory Figure: 13 months energy balance plot with original data



Energy balance plot using the original data for the month of analysis. Missing data have been filled in, if any.



Energy balance plot using the estimated data for the month of analysis



Aston Residence Hall (TAMU Bldg #447)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
HHW	002470	7	11/17/2017 – 11/23/2017	Model

Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
HHW	The consumption dropped for a short period.	10/13/2017 – 10/17/2017, 10/28/2017 – 10/30/2017, 11/17/2017 – 11/23/2017

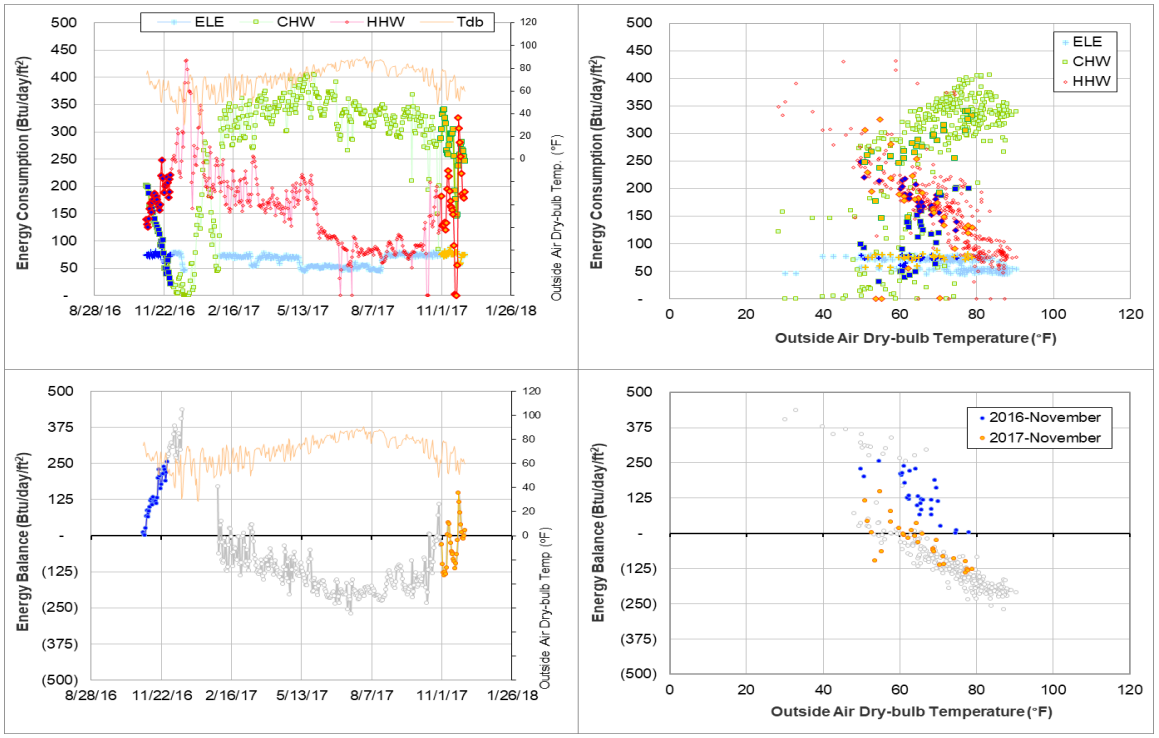
Changes in sensor readings related to the detected issues

Energy Type	Meter ID	Period	Type	Description
HHW	002470	10/13/2017 – 10/17/2017, 11/17/2017 – 11/23/2017	Flow Rate	Decreased to zero
		10/28/2017 – 10/30/2017	Flow Rate	Decreased

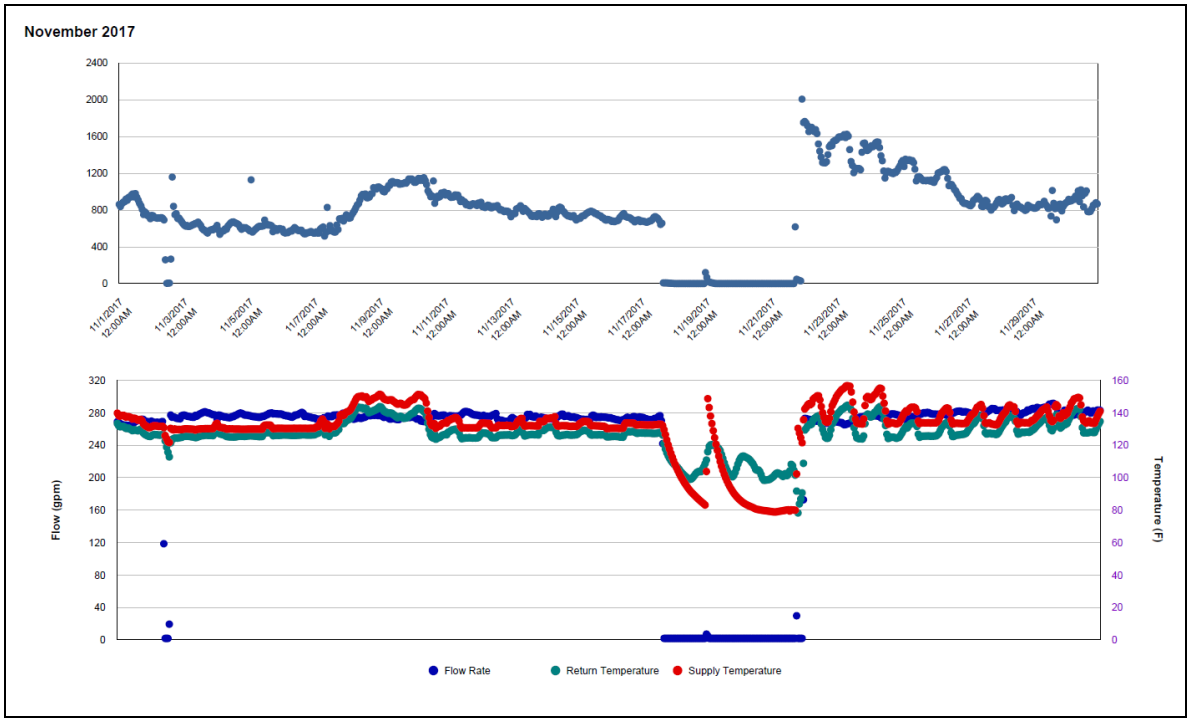
Quantitative descriptions and comments

During 11/17/2017 – 11/23/2017, the HHW consumption suddenly decreased, similar to what happened on October. The flow rate is seen to decrease to zero around this time. The HHW consumption was estimated by model for this period.

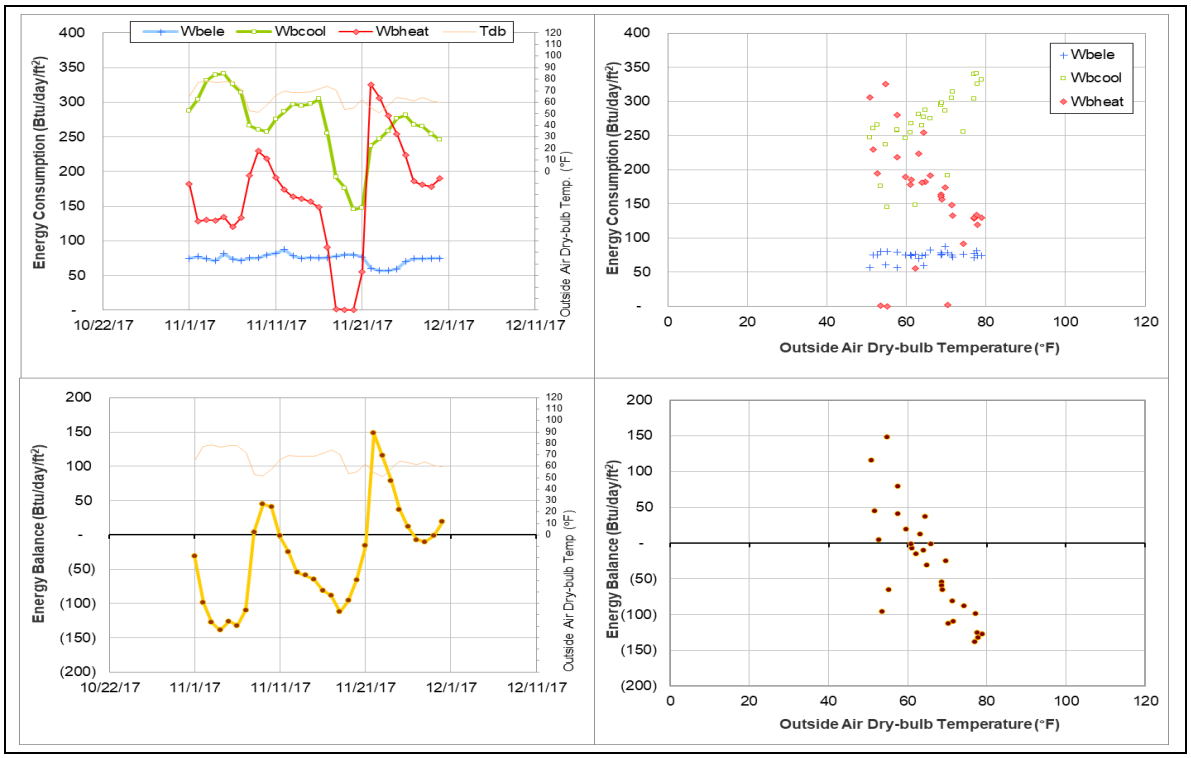
Explanatory Figure: 13 months energy balance plot with original data



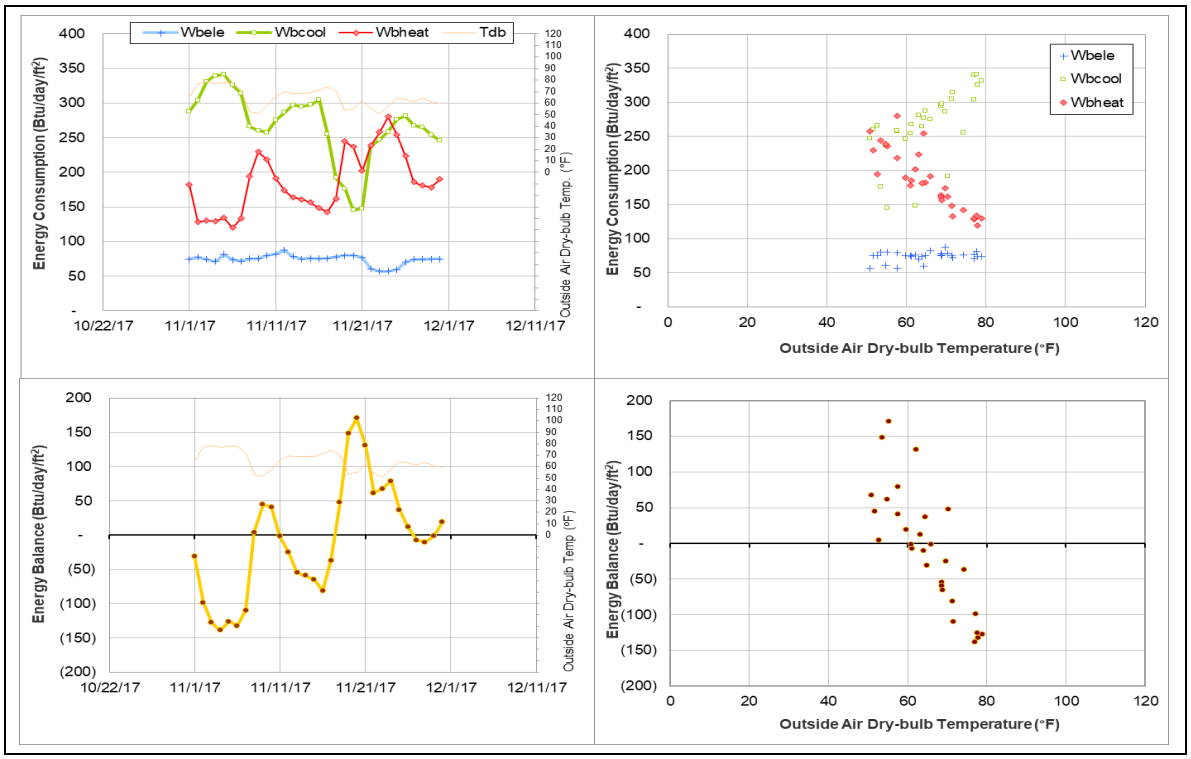
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office (HHW meter during November 2017)



Energy balance plot using the original data for the month of analysis. Missing data have been filled in, if any.



Energy balance plot using the estimated data for the month of analysis



Adams Band Hall (TAMU Bldg #448)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
CHW	002555	30	11/1/2017 – 11/30/2017	Model
HHW	002566	30	11/1/2017 – 11/30/2017	Model

Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
CHW	The consumption level is lower than the level during the past year.	7/24/2017 – Ongoing
HHW	The consumption level is lower than the level during the past year.	7/24/2017 – Ongoing

Changes in sensor readings related to the detected issues

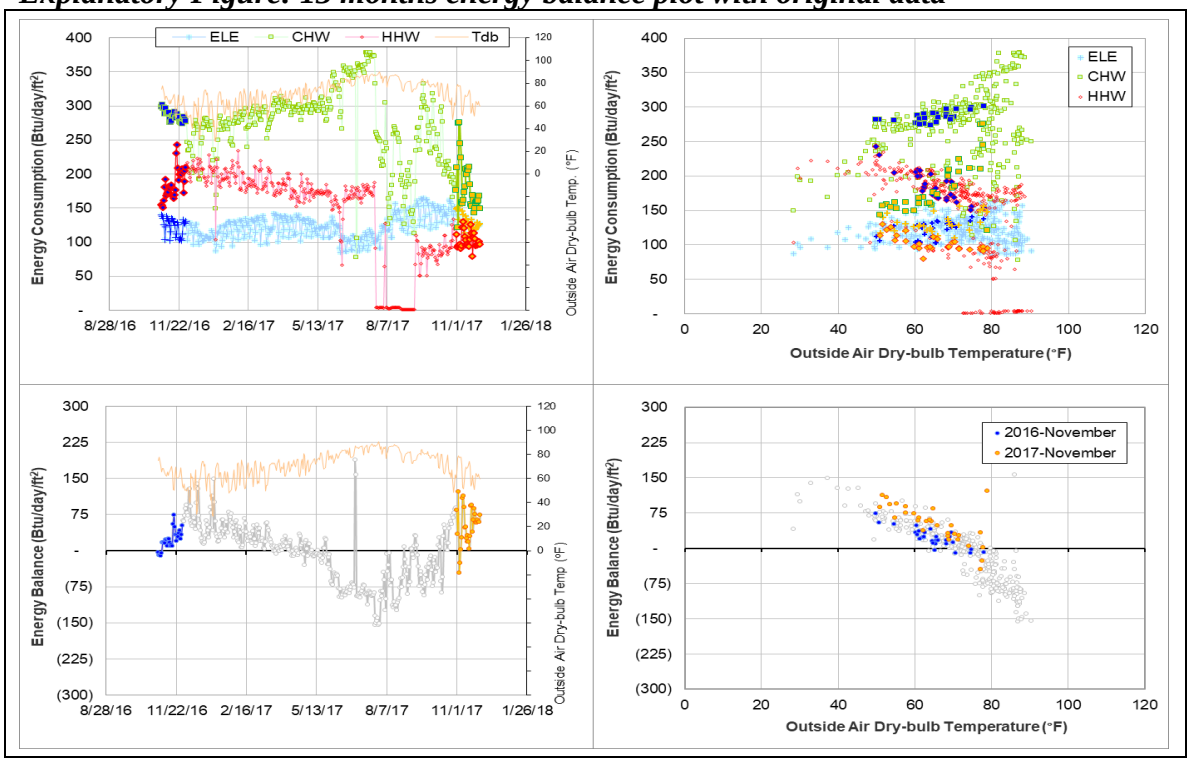
Energy Type	Meter ID	Period	Type	Description
CHW	002555	7/24/2017 – 9/17/2017, 9/28/2017 – Ongoing	Delta-T	Decreased
HHW	002566	7/24/2017 – 9/11/2017	Flow rate	Decreased to zero
		9/11/2017 – 9/18/2017	Delta-T	Decreased
		9/18/207 – Ongoing	Flow rate	Decreased

Quantitative descriptions and comments

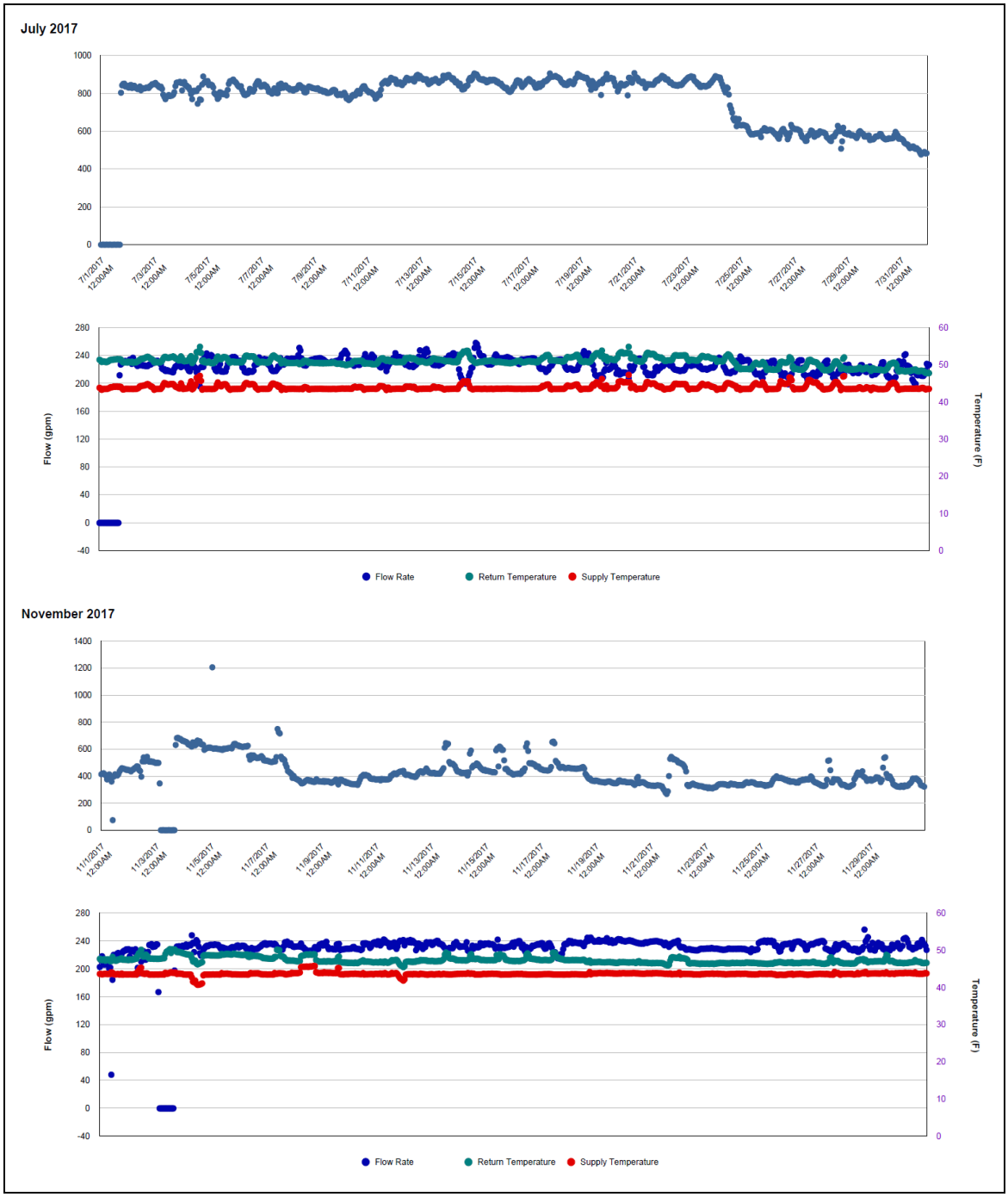
From 7/24/2017 – 9/17/2017 and starting again on 9/28/2017, the CHW return temperature decreased resulting in a reduced and scattered consumption pattern. When compared to November 2016, the pattern reduced by as much as 130 Btu/day/ft^2 (up to 45% lower). The CHW consumption was estimated by model for this month.

The HHW consumption decreased starting 7/24/2017 and continues. From 7/24/2017 to 9/11/2017, the HHW flow rate appears to decrease to zero or near zero values and then returns on 9/12/2017. After the flow rate increased, the Delta-T then decreased from 9/11/2017 – 9/18/2017. Then on 9/18/2017, the flow rate decreased again but the Delta-T increased. However, with the increase in Delta-T, the overall consumption is lower than the previous year pattern. When compared to November 2016, the pattern reduced by 60 – 110 Btu/day/ft^2. The HHW consumption was estimated by model for this month.

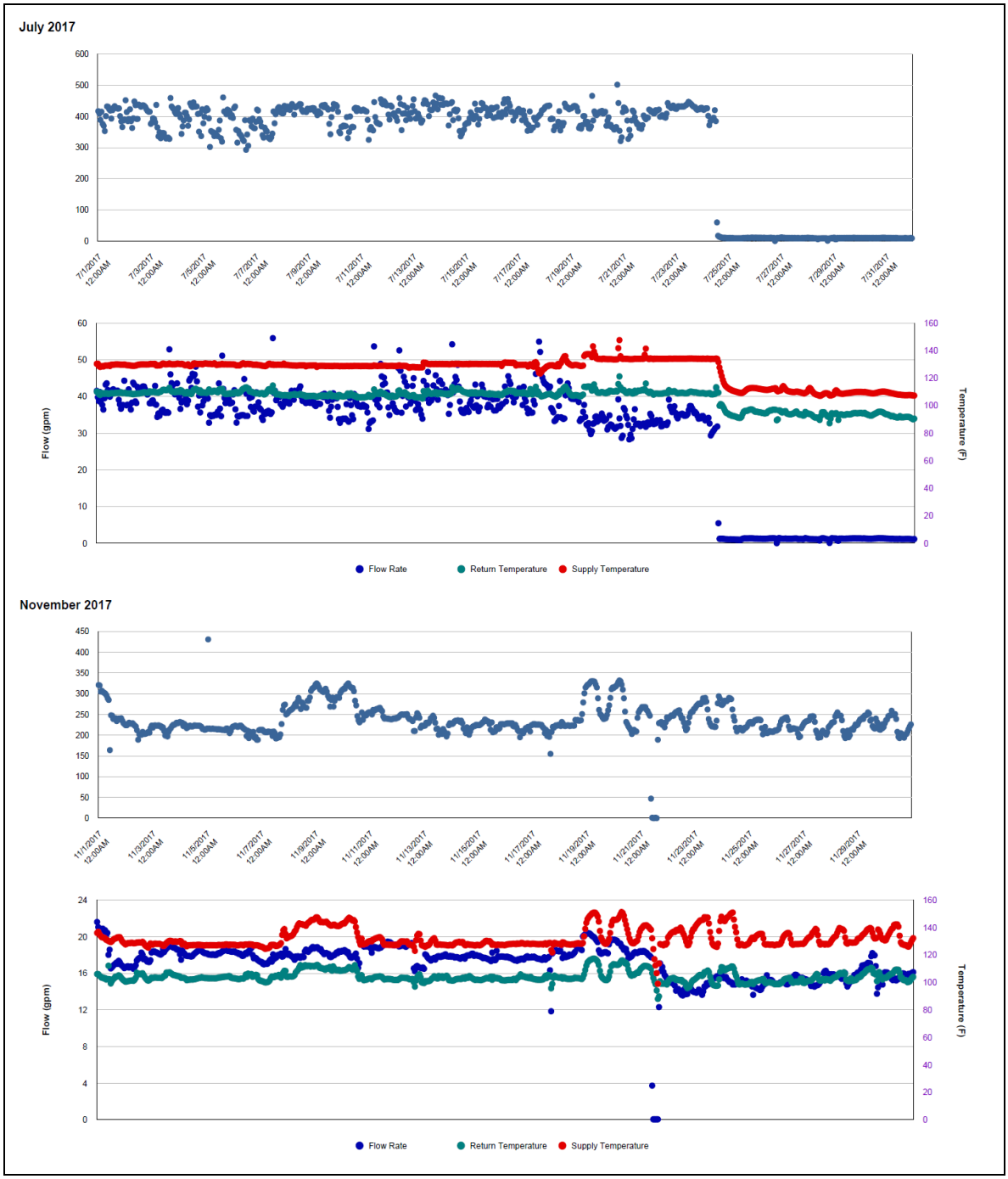
Explanatory Figure: 13 months energy balance plot with original data



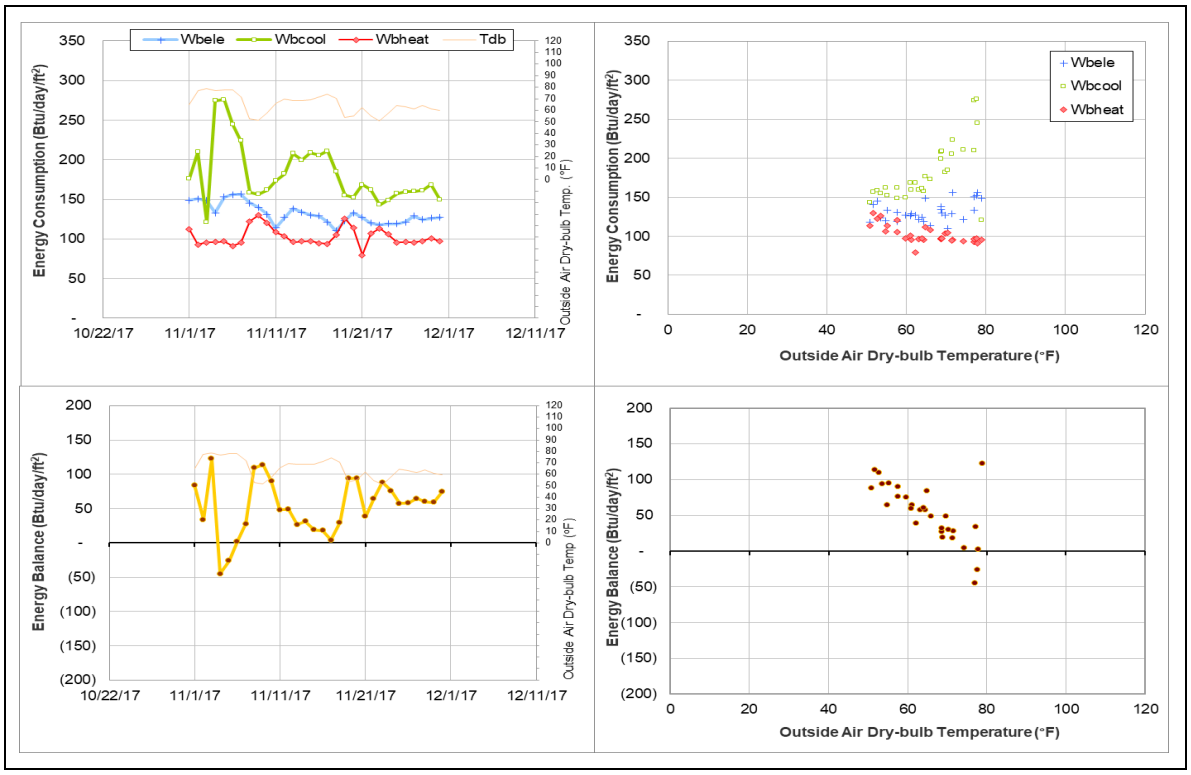
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office (CHW meter during July 2017 (top) and November 2017 (bottom))



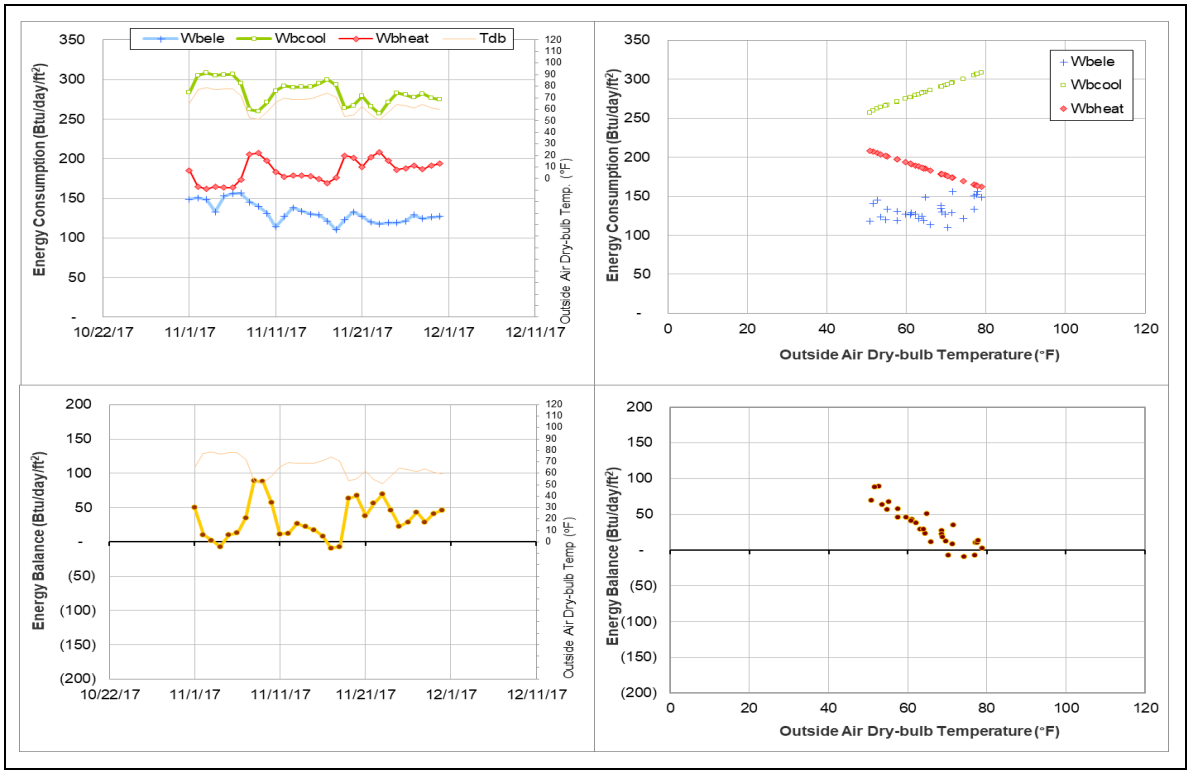
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office (HHW meter during July 2017 (top) and November 2017 (bottom))



Energy balance plot using the original data for the month of analysis. Missing data have been filled in, if any.



Energy balance plot using the estimated data for the month of analysis



TAES Annex Building (TAMU Bldg #457)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
CHW	005913	4	11/8/2017 – 11/9/2017, 11/19/2017 – 11/20/2017	Model

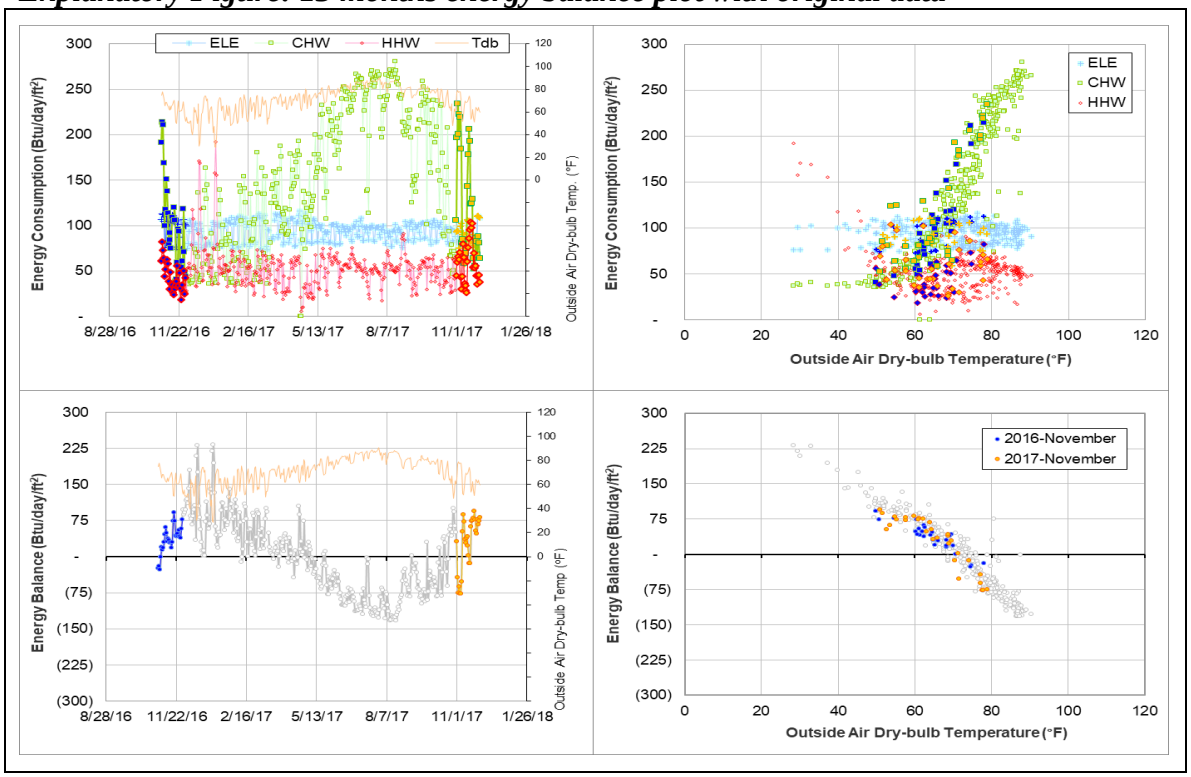
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
CHW	The consumption increased for a short period.	11/8/2017 – 11/9/2017, 11/19/2017 – 11/20/2017

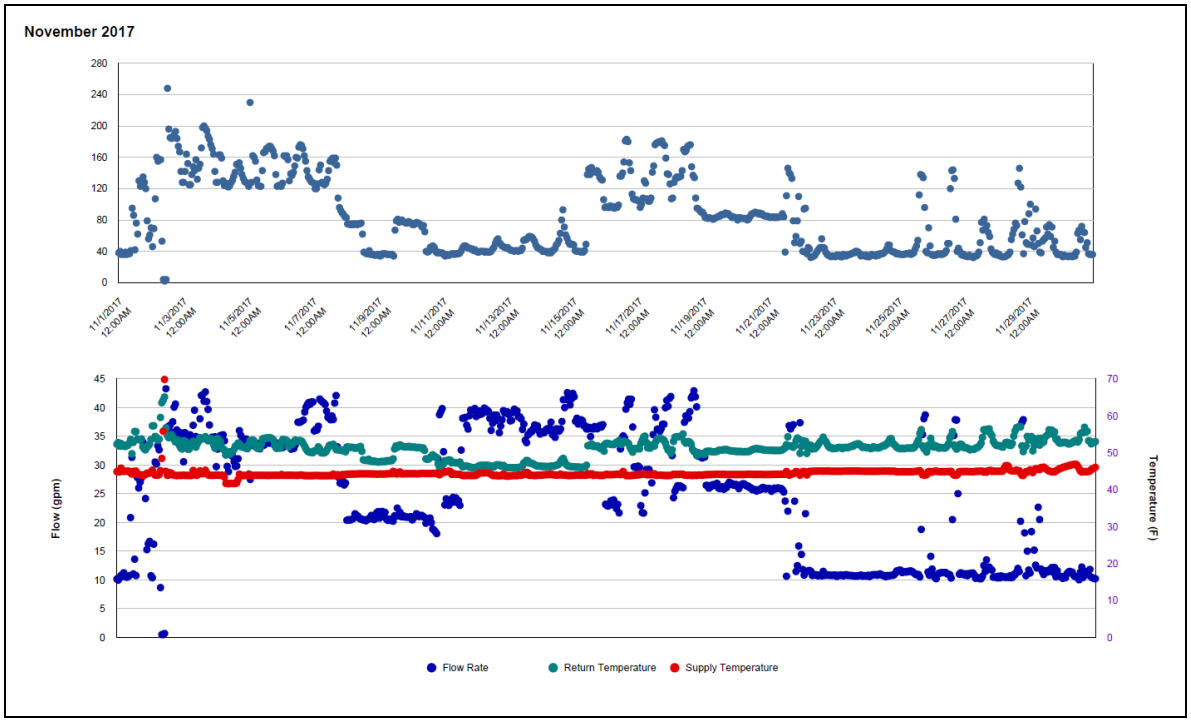
Quantitative descriptions and comments

For 11/8/2017 – 11/9/2017 and 11/19/2017 – 11/20/2017, the CHW consumption is higher than 13-month pattern by about 75 Btu/day/ft^2 and 41 Btu/day/ft^2, respectively. There are no apparent meter issues. This higher consumption during cooler temperatures appears to be related to sudden changes in outside air temperature leaving the building with a residual thermal load that has not dissipated yet. The CHW consumption was estimated by model for these periods.

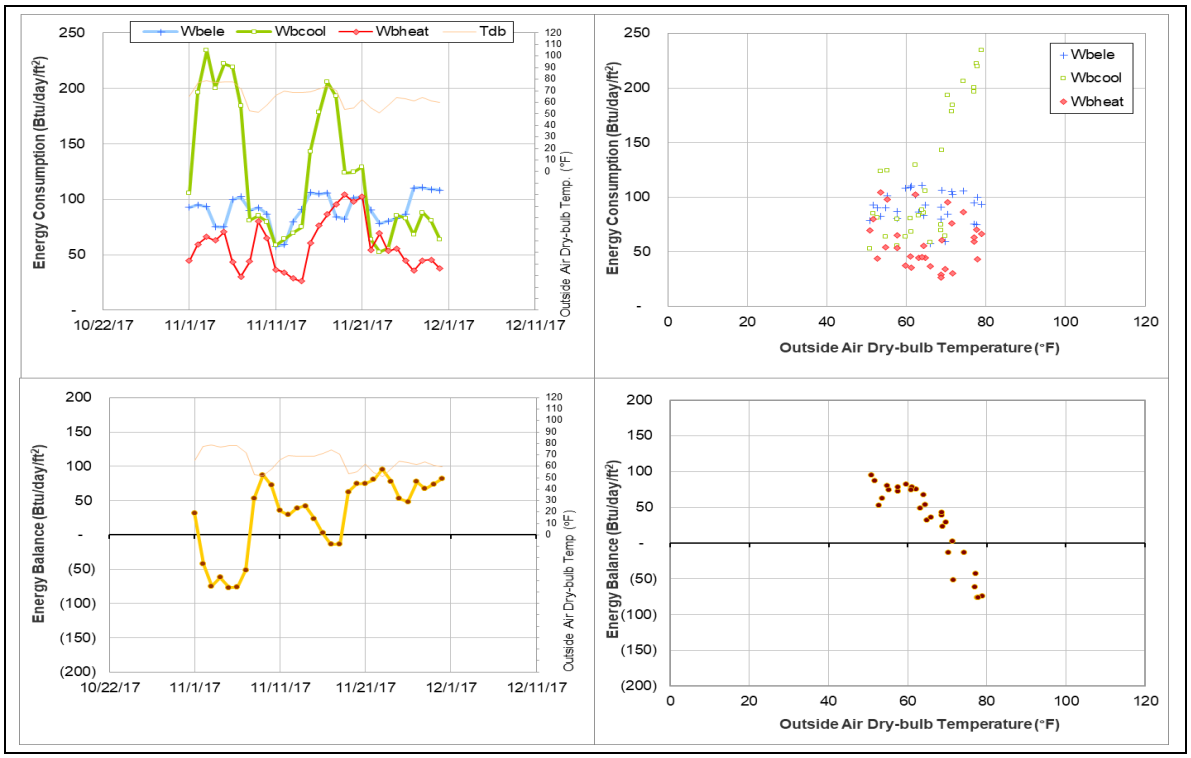
Explanatory Figure: 13 months energy balance plot with original data



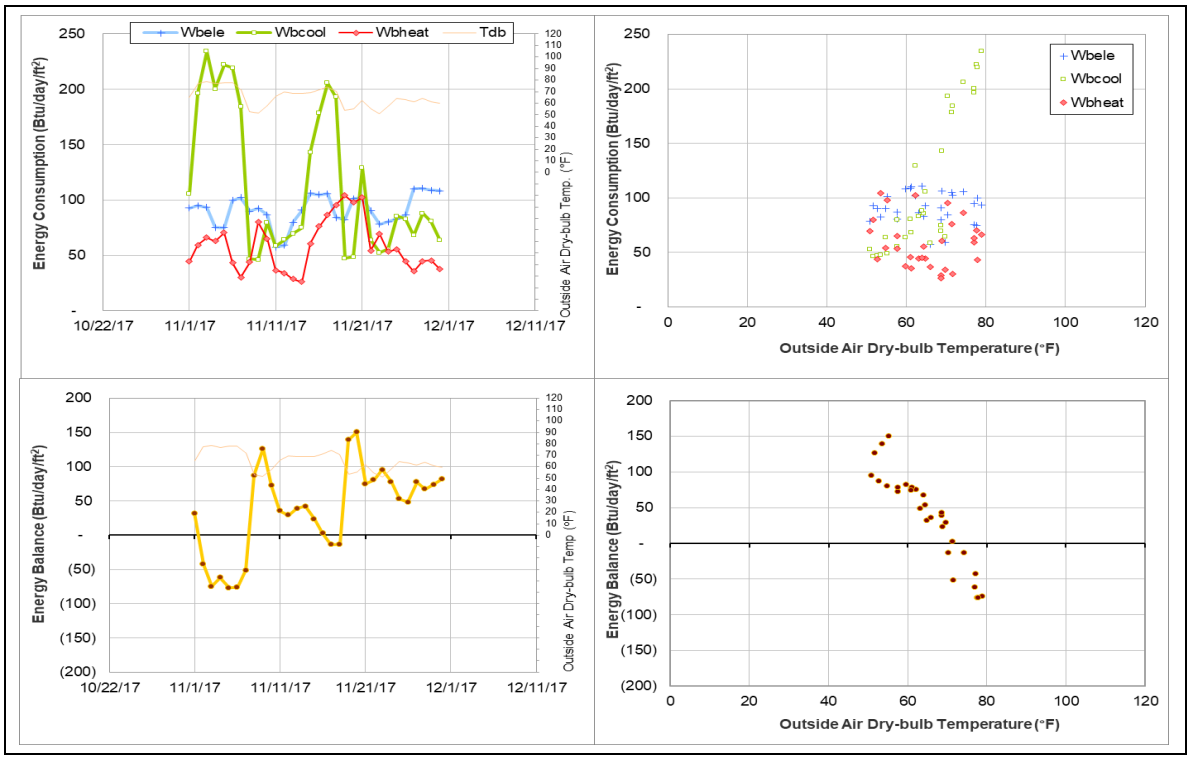
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office (CHW meter during November 2017)



Energy balance plot using the original data for the month of analysis. Missing data have been filled in, if any.



Energy balance plot using the estimated data for the month of analysis



Biological Sciences Building - East (TAMU Bldg #467)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
CHW	003851	30	11/1/2017 – 11/30/2017	Model

Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
CHW	The metered values appear to be faulty.	8/6/2016 – Ongoing
	The consumption level has decreased suddenly.	11/19/2017 – Ongoing

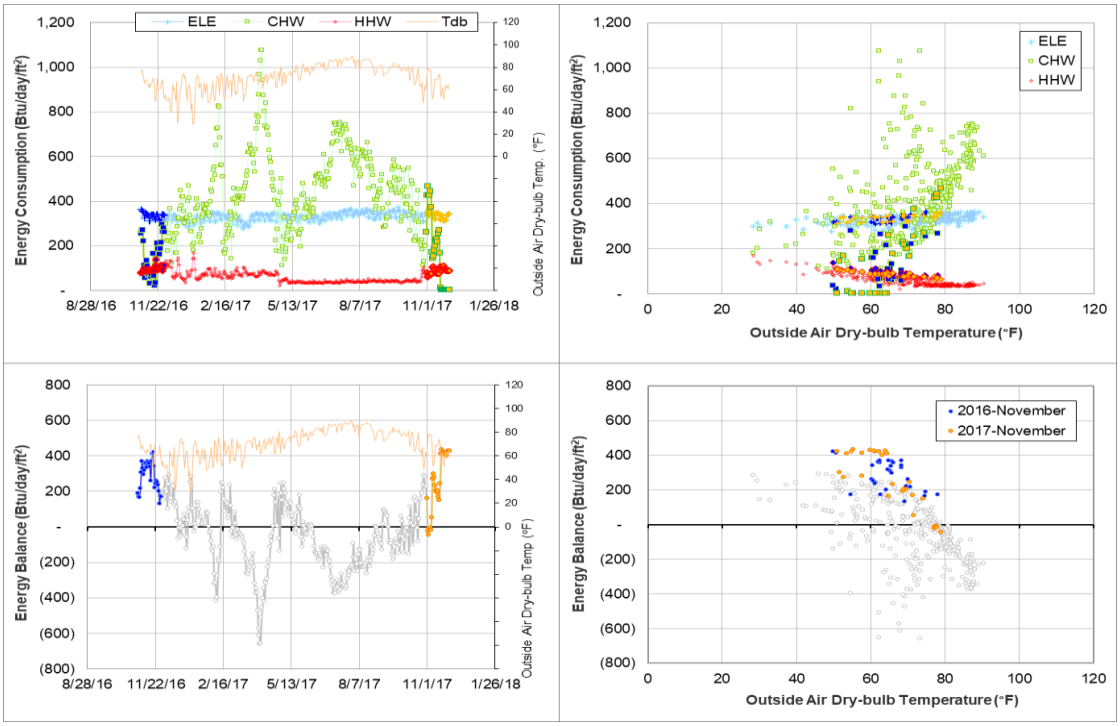
Changes in sensor readings related to the detected issues

Energy Type	Meter ID	Period	Type	Description
CHW	003851	8/6/2016 – Ongoing	Supply Temperature	Faulty
		11/19/2017 – Ongoing	Flow Rate	Decrease to zero

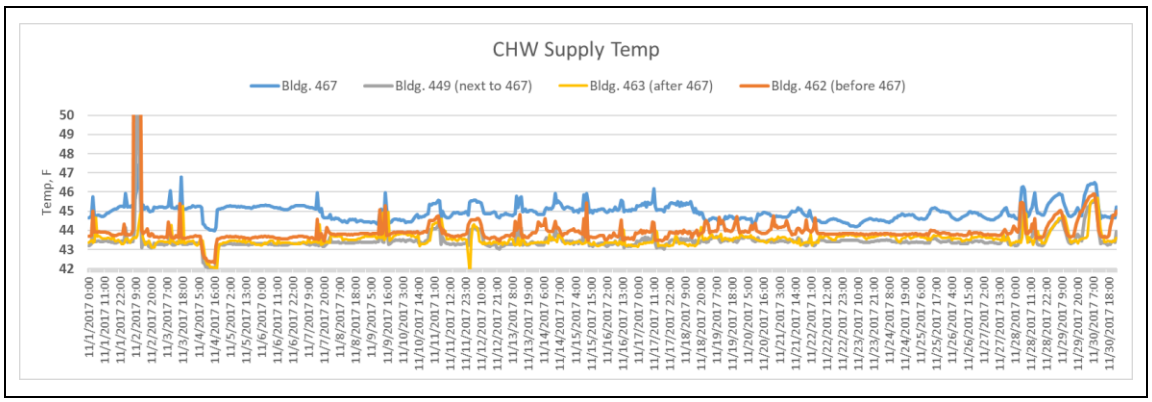
Quantitative descriptions and comments

The CHW supply temp readings for this building started to decrease on 8/6/2016 while all adjacent buildings have stable supply temperature at around 42°F. The supply temperature had a period of obviously erroneous values of 20°F during 9/10 – 9/20/2016, and then increased to 45°F range. The explanatory figure below shows the supply temperature for Bldg. #467 and the surrounding Bldgs. #462, #449, and #463. The temperature sensor for Bldg. #467 shows to be almost two degrees higher than its neighboring buildings. A new issue appeared this month. Starting on 11/19/2017, the CHW flow rate decreased to zero or near zero values causing the potentially faulty meter consumption to drop to zero or near zero values. The CHW consumption was estimated by model for this month.

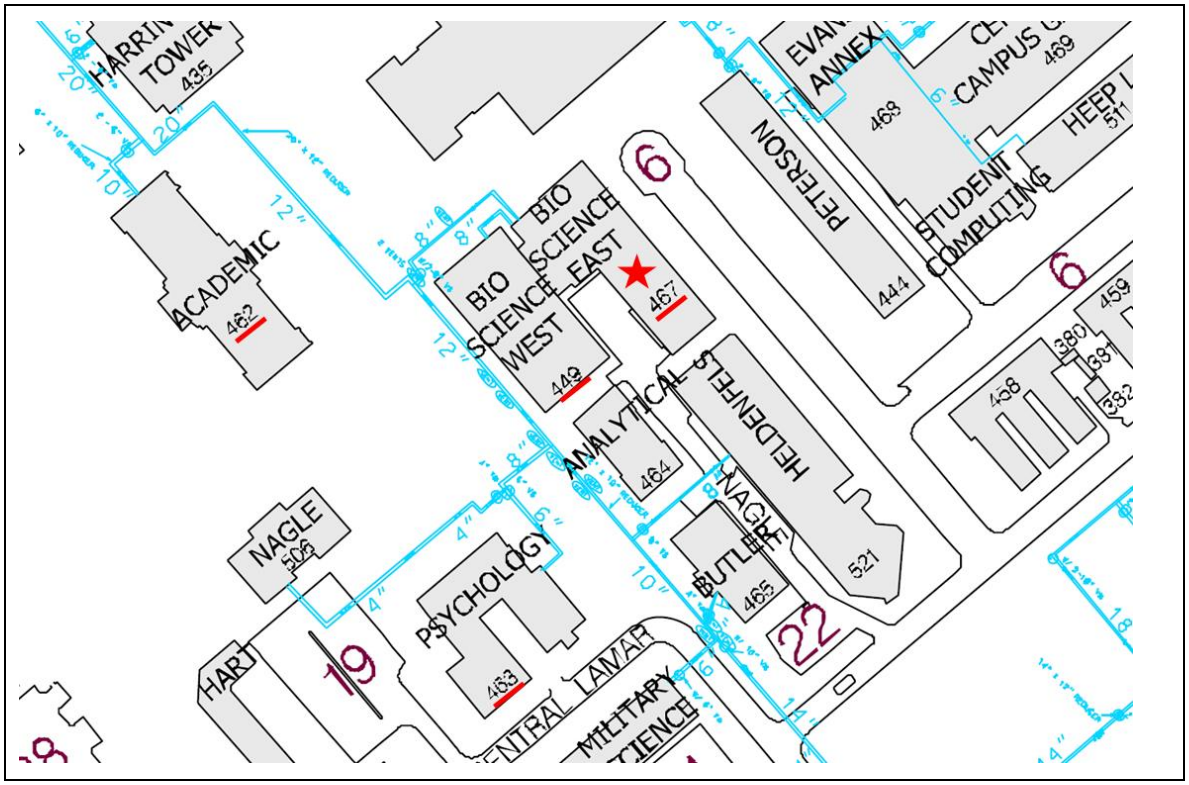
Explanatory Figure: 13 months energy balance plot with original data



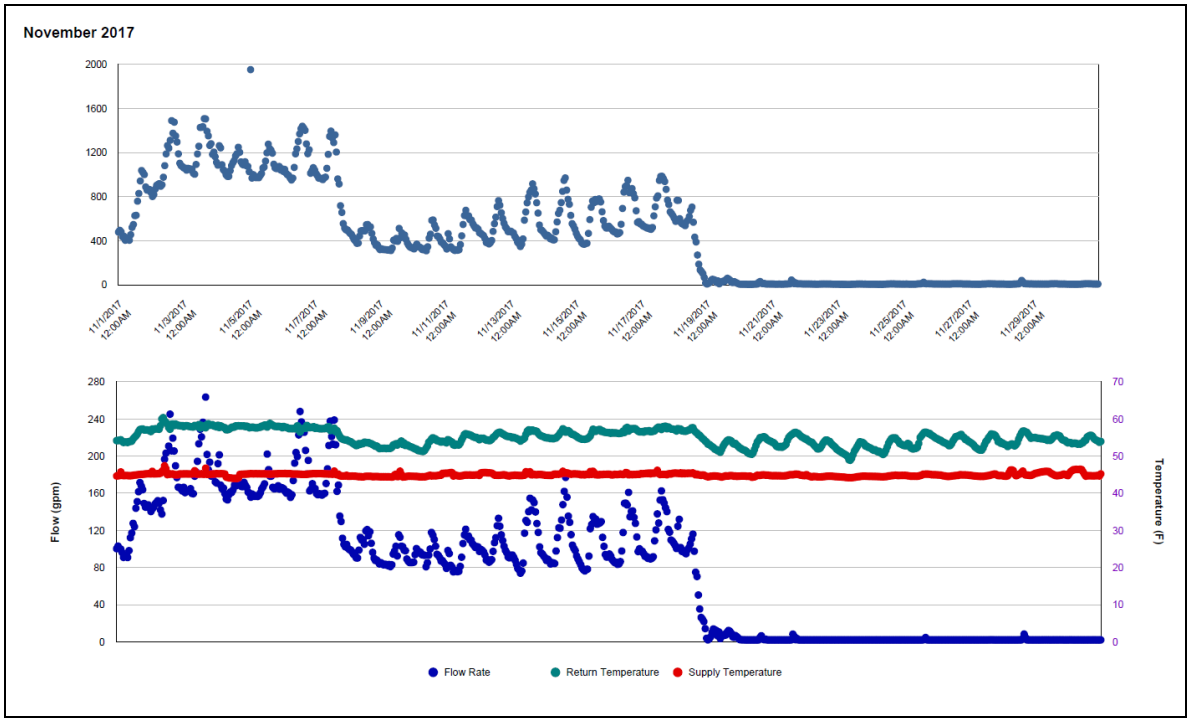
Explanatory Figure: Time series plot of hourly average CHW supply temperature for Bldgs. #467 Biological Sciences East, #462 Academic, #449 Biological Sciences West, and #463 Psychology. (November 2017)



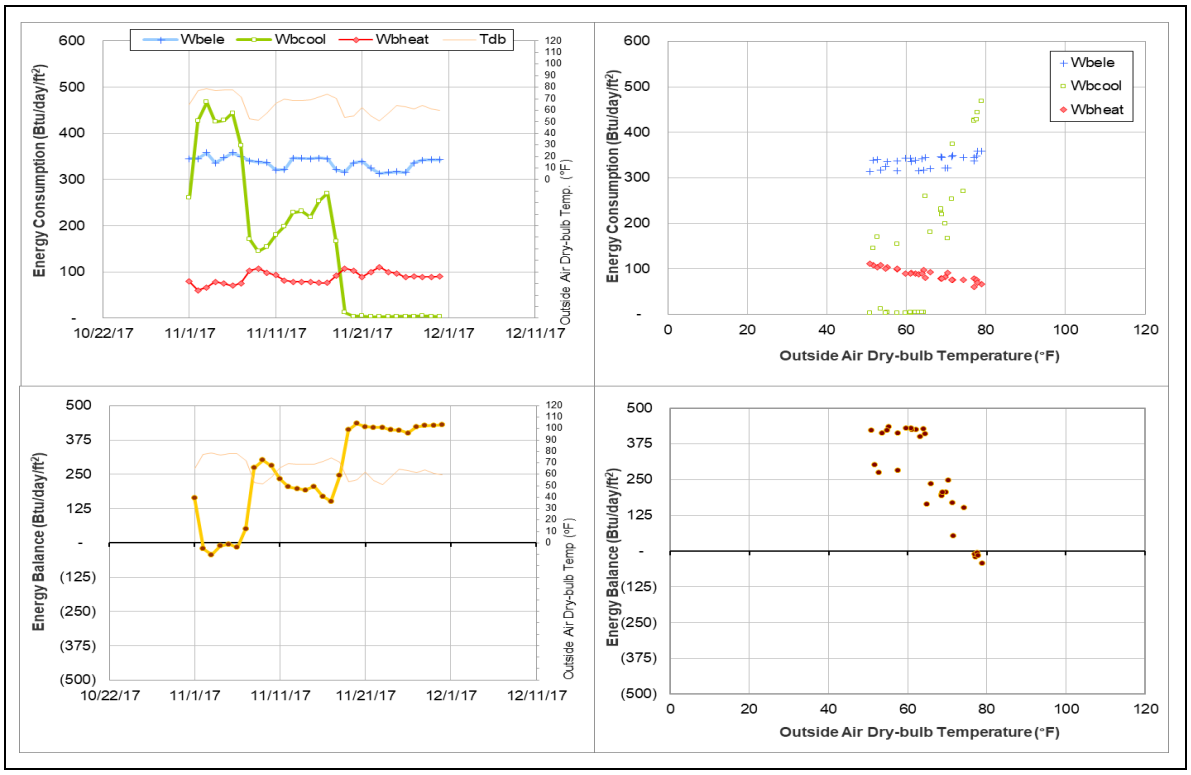
Explanatory Figure: CHW distribution with Bldgs. #467 Biological Sciences East, #462 Academic, #449 Biological Sciences West, and #463 Psychology highlighted.



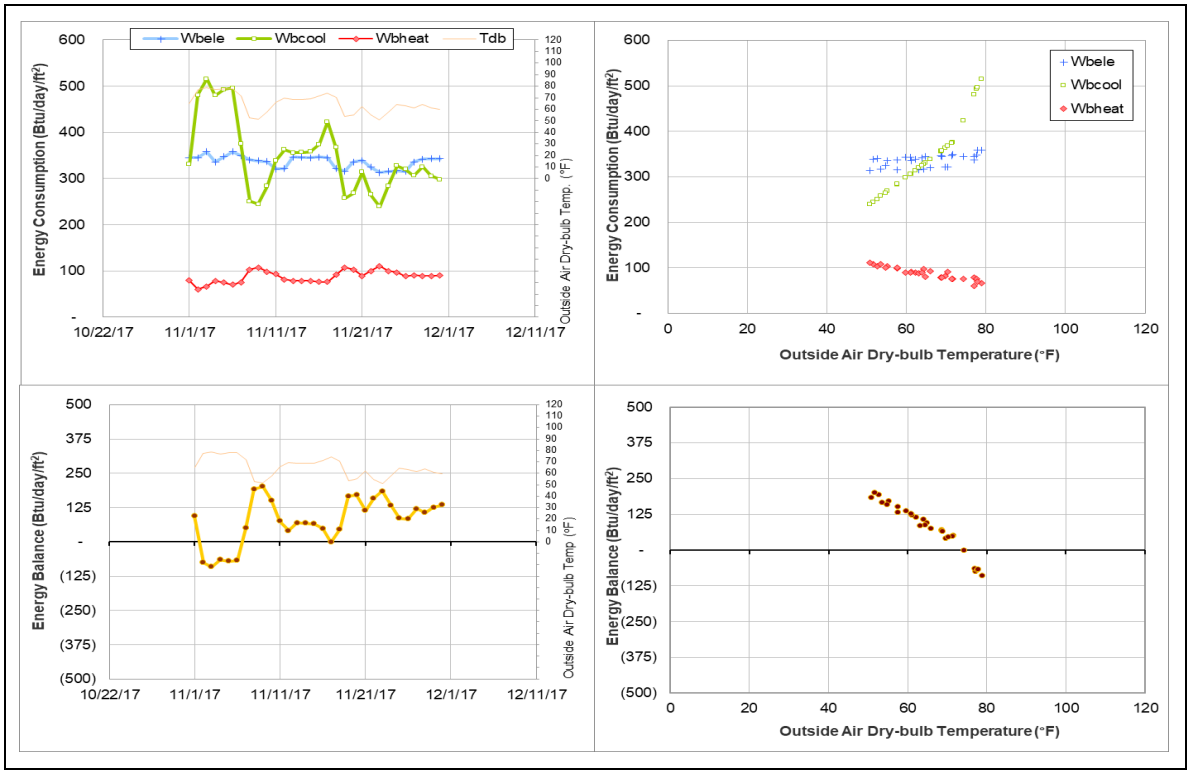
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office (CHW meter during November 2017)



Energy balance plot using the original data for the month of analysis. Missing data have been filled in, if any.



Energy balance plot using the estimated data for the month of analysis



Evans Library (TAMU Bldg #468)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
HHW	003712	18	11/1/2017 – 11/12/2017, 11/25/2017 – 11/30/2017	Model

Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
HHW #003712	The consumption level has increased suddenly.	9/5/2017 – Ongoing

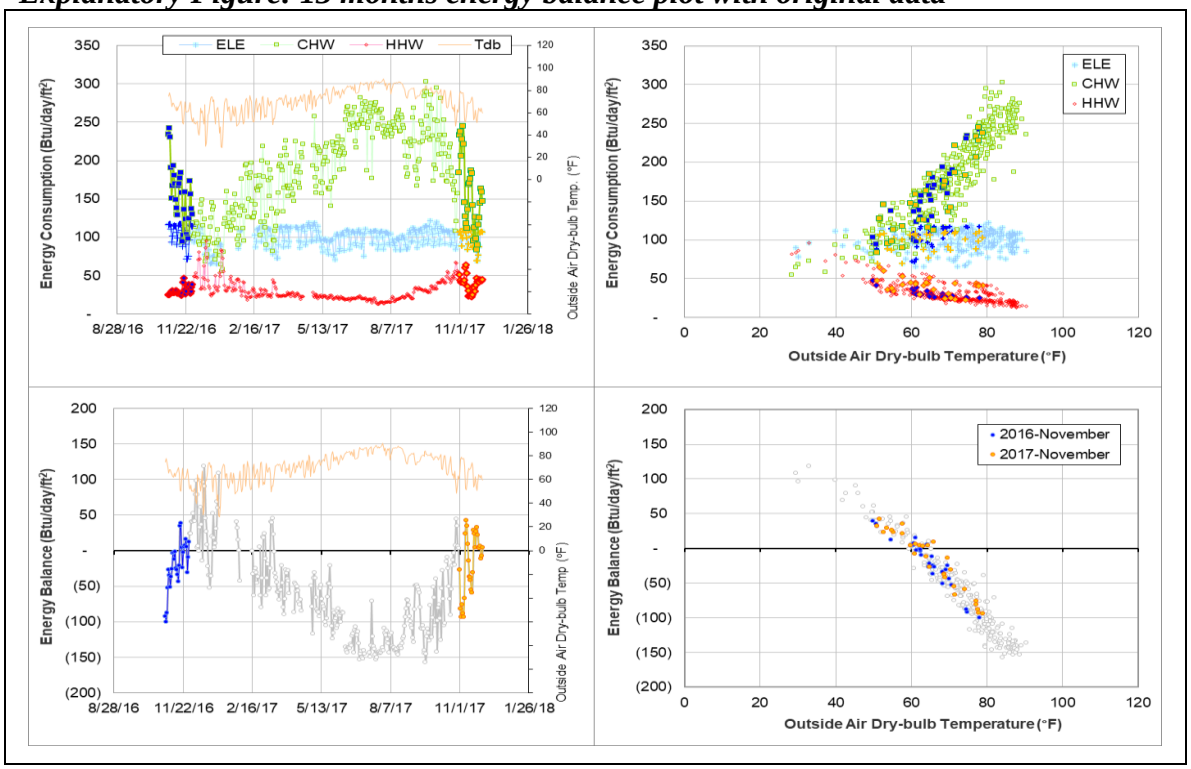
Changes in sensor readings related to the detected issues

Energy Type	Meter ID	Period	Type	Description
HHW	003712	9/5/2017 – Ongoing	Flow rate	Increased

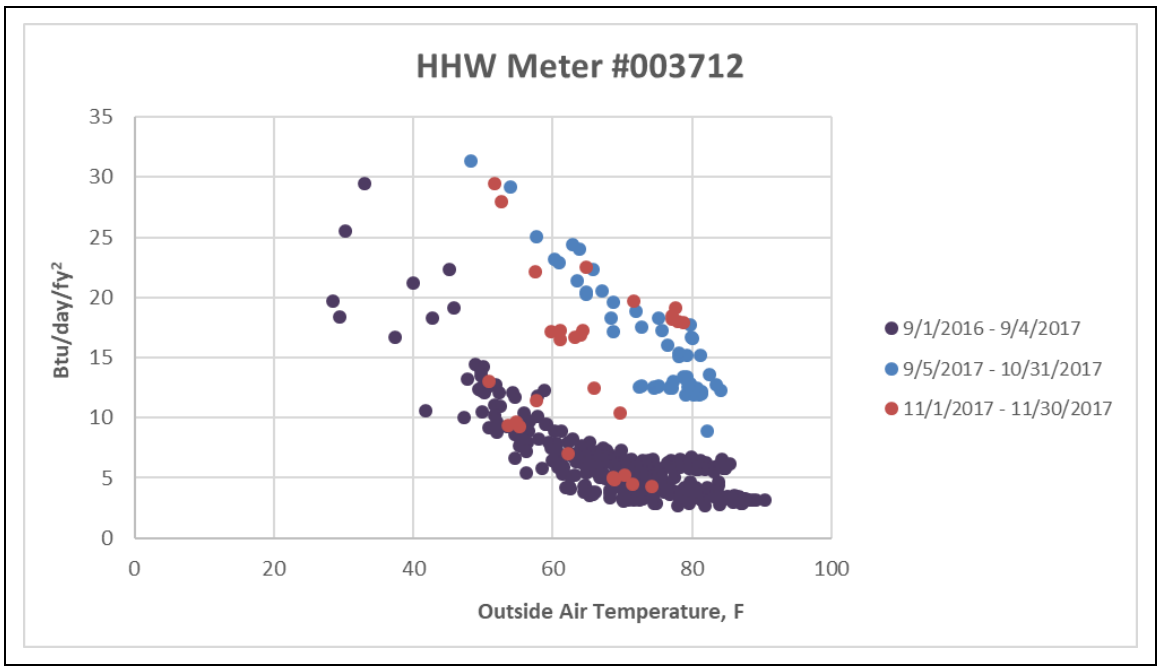
Quantitative descriptions and comments

Evans Library has five HHW meters. Starting 9/5/2017, HHW meter #003712 experienced an increase in flow rate from about 15 gpm to 50-60 gpm. For the month of November 2017, the flow rate fluctuated: started high in the 75 – 110 gpm range for 11/1/2017 – 11/10/2017, dropped to the 40 – 55 gpm range for 11/11/2017 – 11/13/2017, dropped to the 15 – 45 gpm range for 11/14/2017 – 11/24/2017, and then increased to the 60 – 90 gpm range for 11/25/2017 – 11/30/2017. When the flow rate increased into the higher ranges, the consumption for this metered increased by as much as 16 Btu/day/ft^2. The explanatory figure below shows these fluctuations in November. In August 2017, before the increase, HHW meter #003712 accounted for only 26% of the total HHW consumption. Now, in November 2017, it accounts for 51% of the total. The HHW consumption for this meter was estimated by model for this month.

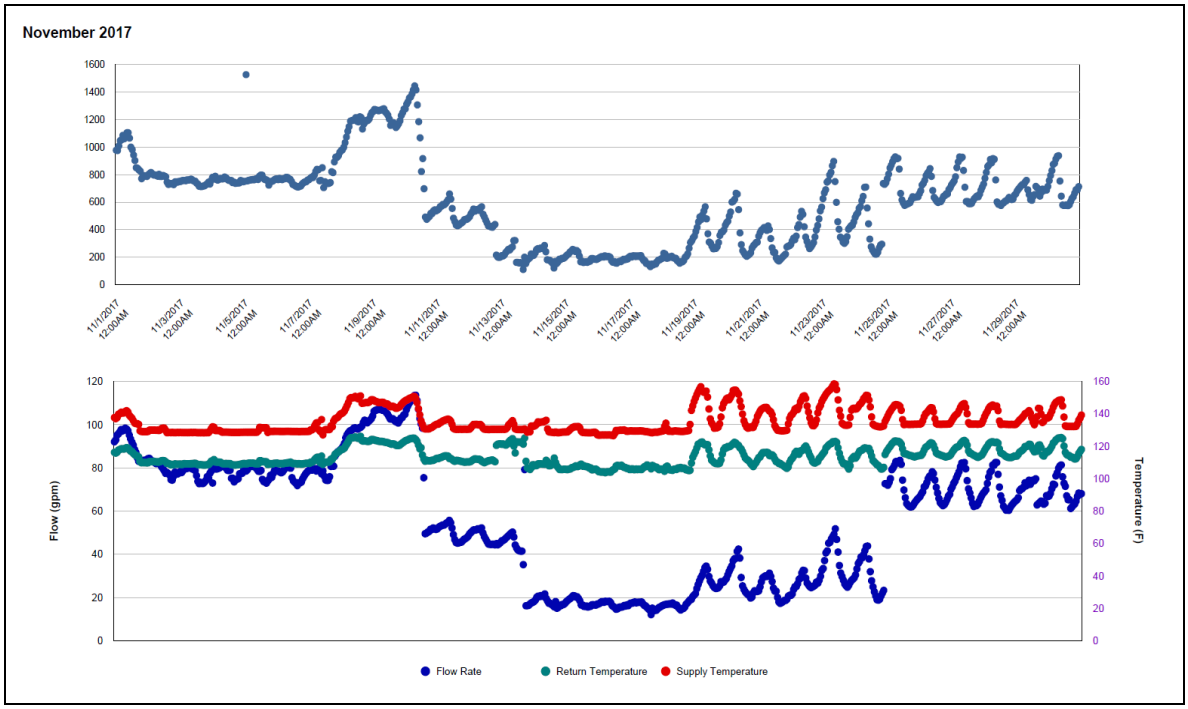
Explanatory Figure: 13 months energy balance plot with original data



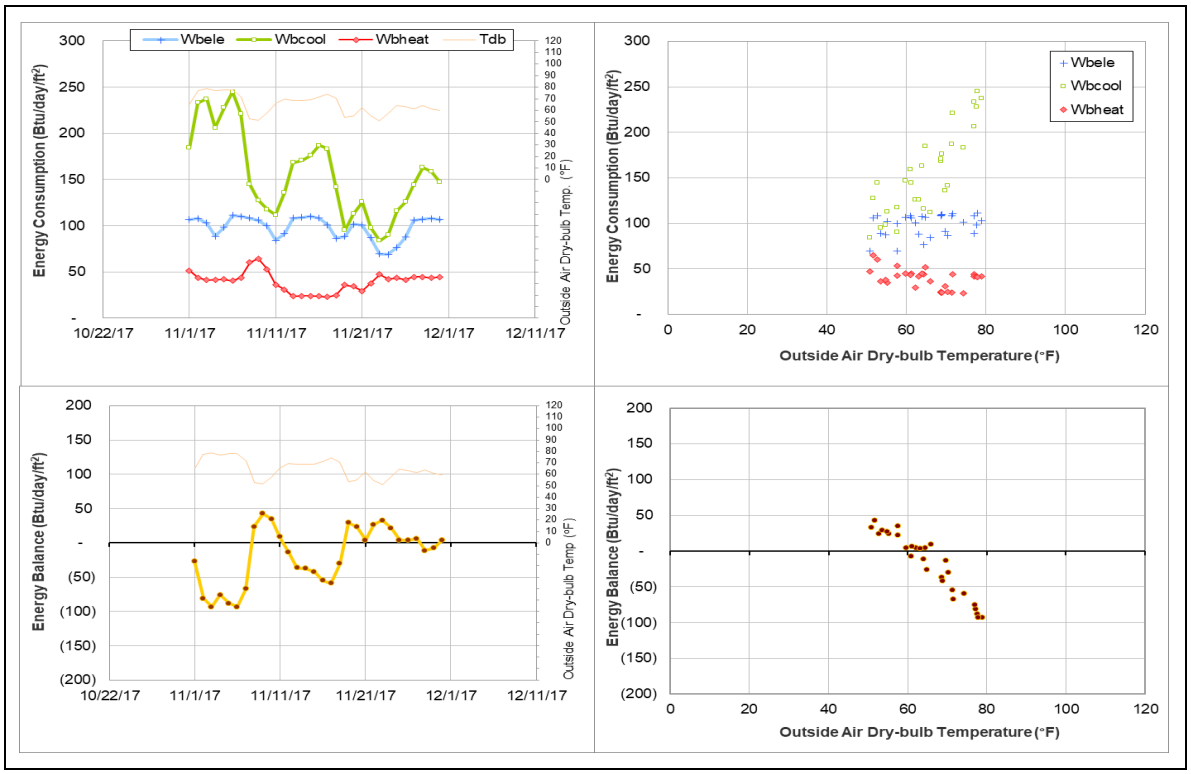
Explanatory Figure: Scatter plot of HHW Meter #003712 versus outside air temperature showing the pattern before and after 9/5/2017.



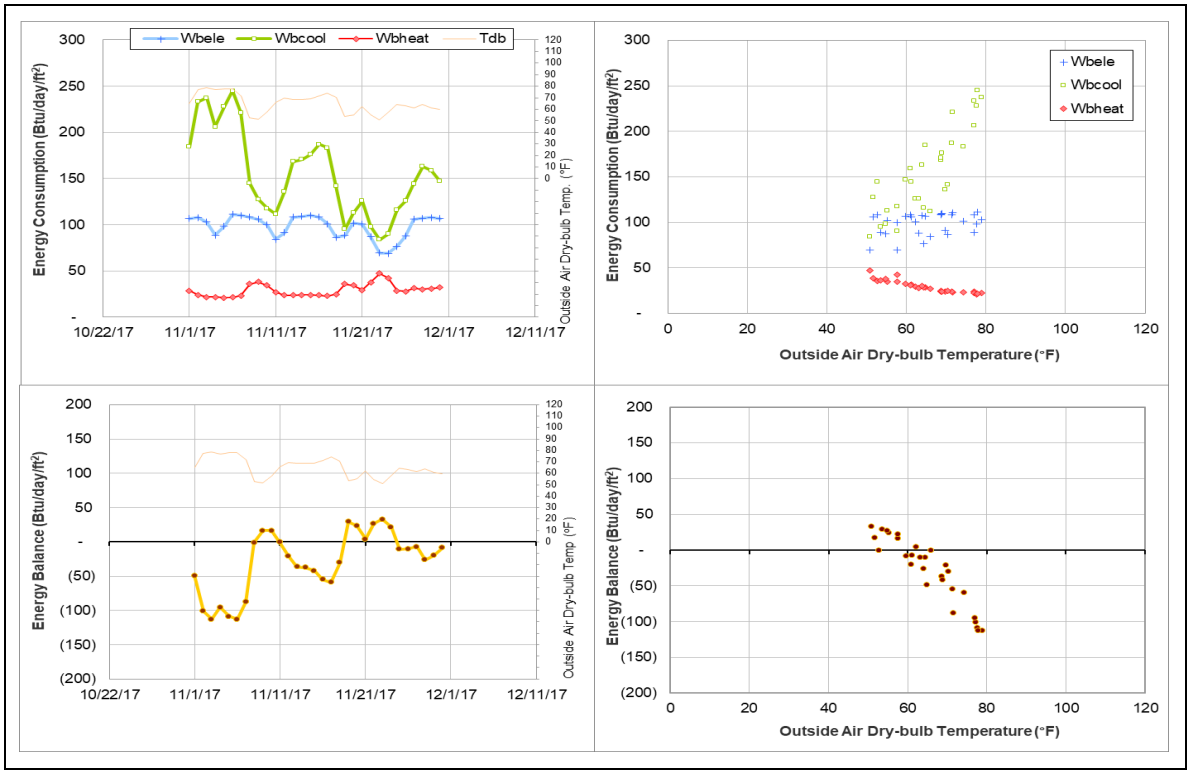
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office (HHW meter #003712 during November 2017)



Energy balance plot using the original data for the month of analysis. Missing data have been filled in, if any.



Energy balance plot using the estimated data for the month of analysis



Glasscock History Building (TAMU Bldg # 470)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
HHW	006642	12	11/20/2017 – 11/30/2017	Model

Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
HHW	The metered values appear to be faulty.	11/20/2017 – 11/30/2017

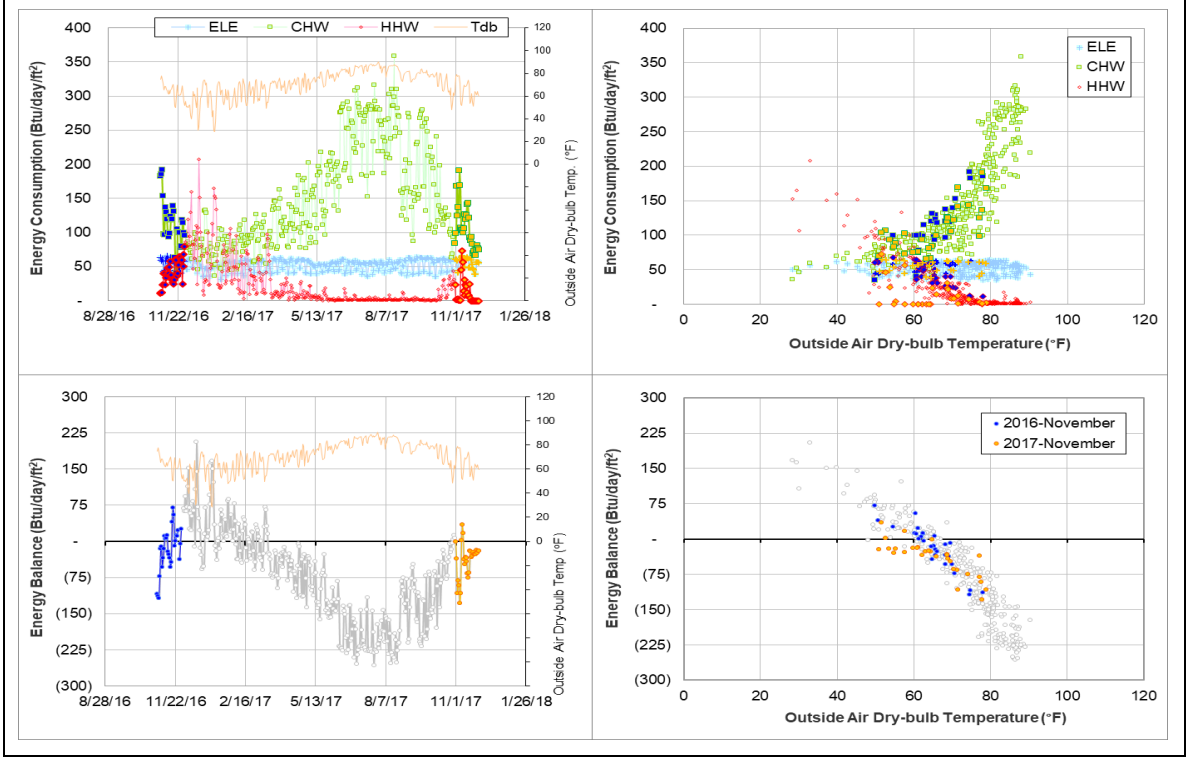
Changes in sensor readings related to the detected issues

Energy Type	Meter ID	Period	Type	Description
HHW	006642	11/20/2017 – 11/30/2017	Supply Temp	Faulty

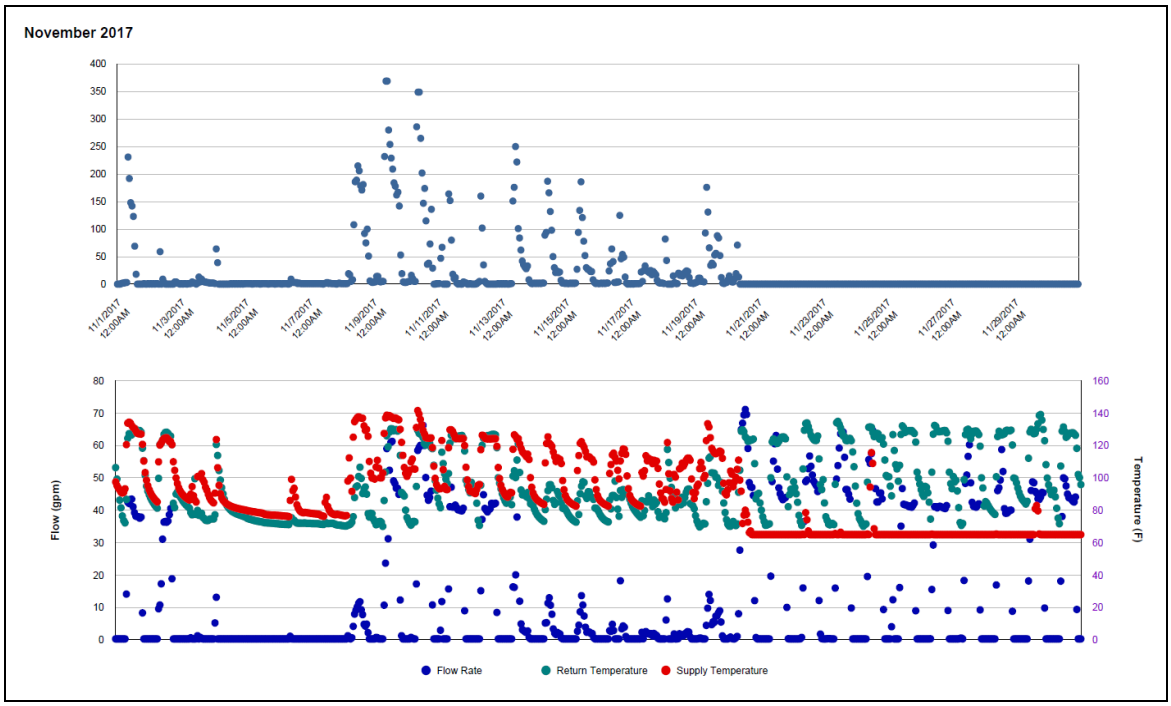
Quantitative descriptions and comments

The HHW consumption decreased to zero starting 11/20/2017. The supply temperature decreased to below 70°F and maintained a constant value (expect for an occasional spike); this caused the delta-T to become negative. The HHW consumption was estimated by model for this period.

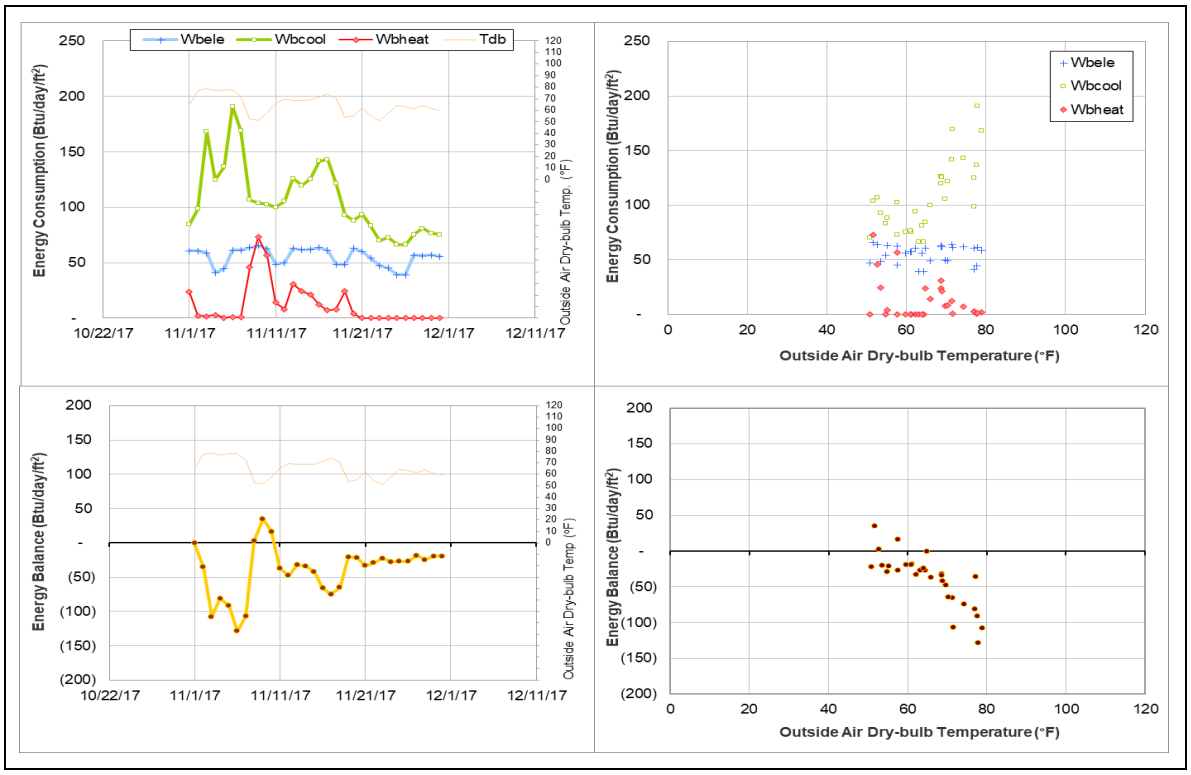
Explanatory Figure: 13 months energy balance plot with original data



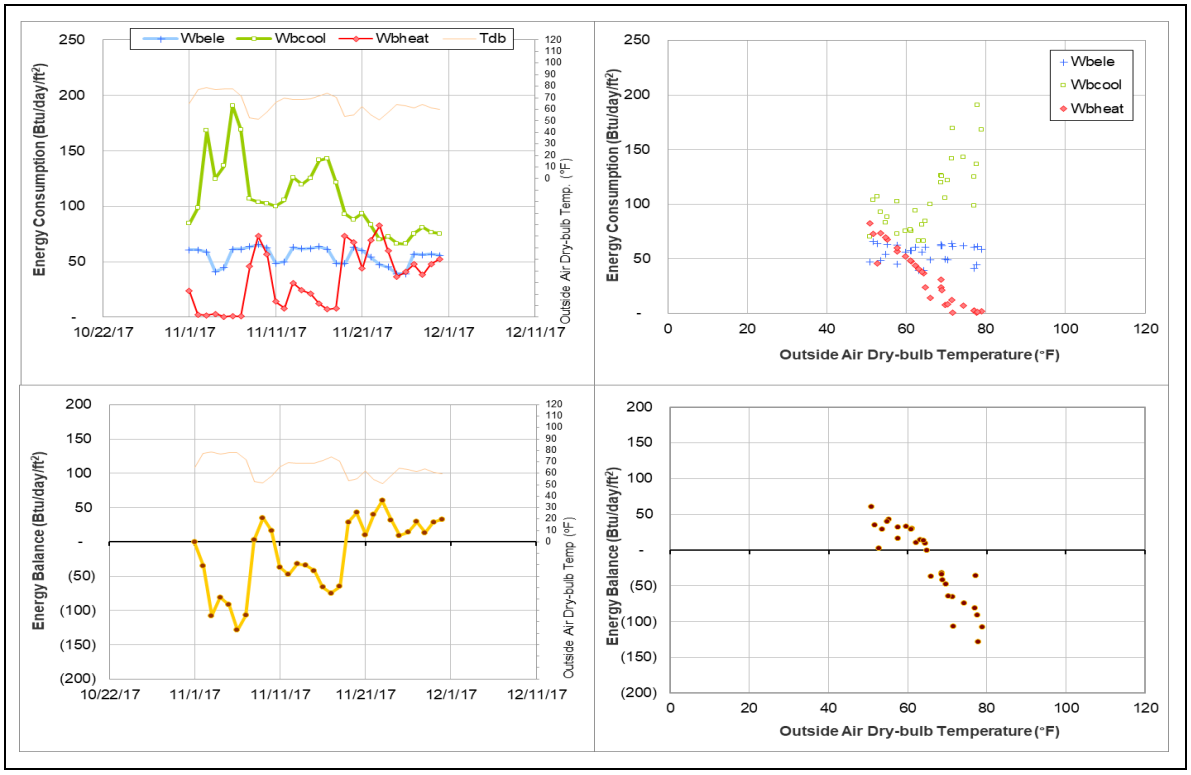
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office (HHW during November 2017)



Energy balance plot using the original data for the month of analysis. Missing data have been filled in, if any.



Energy balance plot using the estimated data for the month of analysis



YMCA Building (TAMU Bldg #474)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
HHW	007526	7	11/1/2017 – 11/7/2017	Model

Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
HHW	The consumption dropped for a short period.	7/27/2017 – 11/7/2017

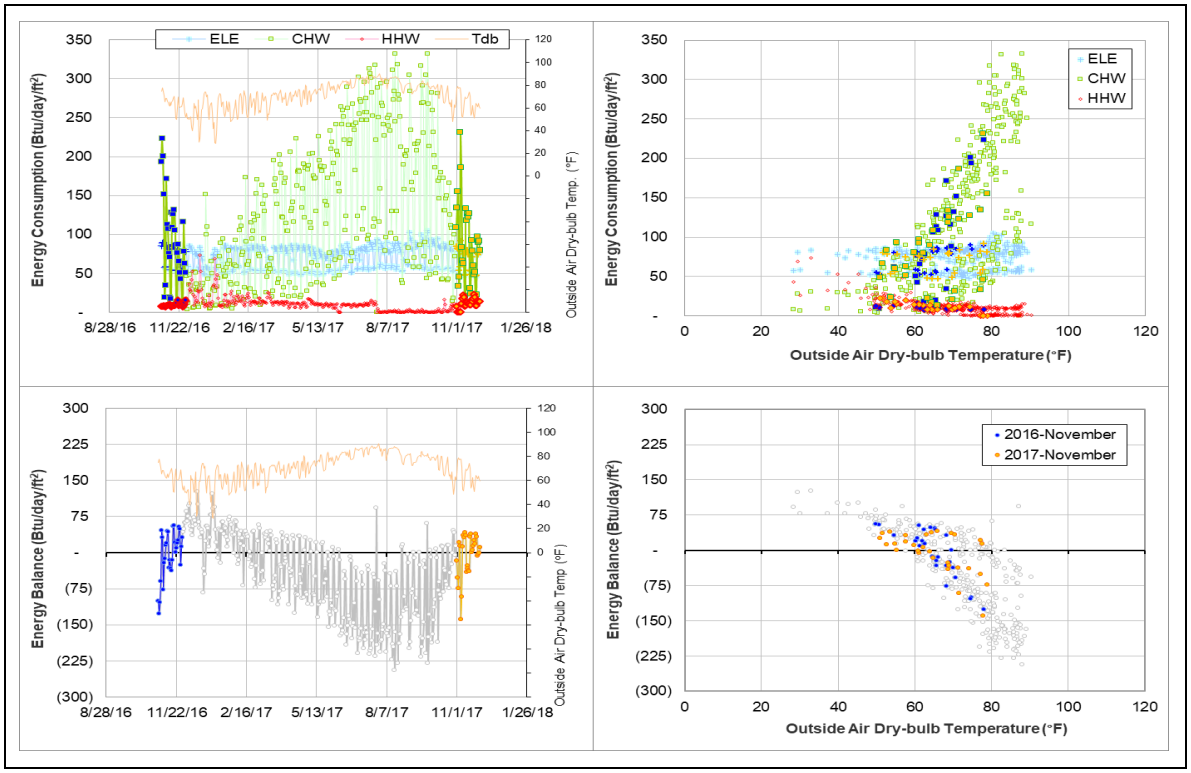
Changes in sensor readings related to the detected issues

Energy Type	Meter ID	Period	Type	Description
HHW	007526	7/27/2017 – 11/7/2017	Delta-T	Negative

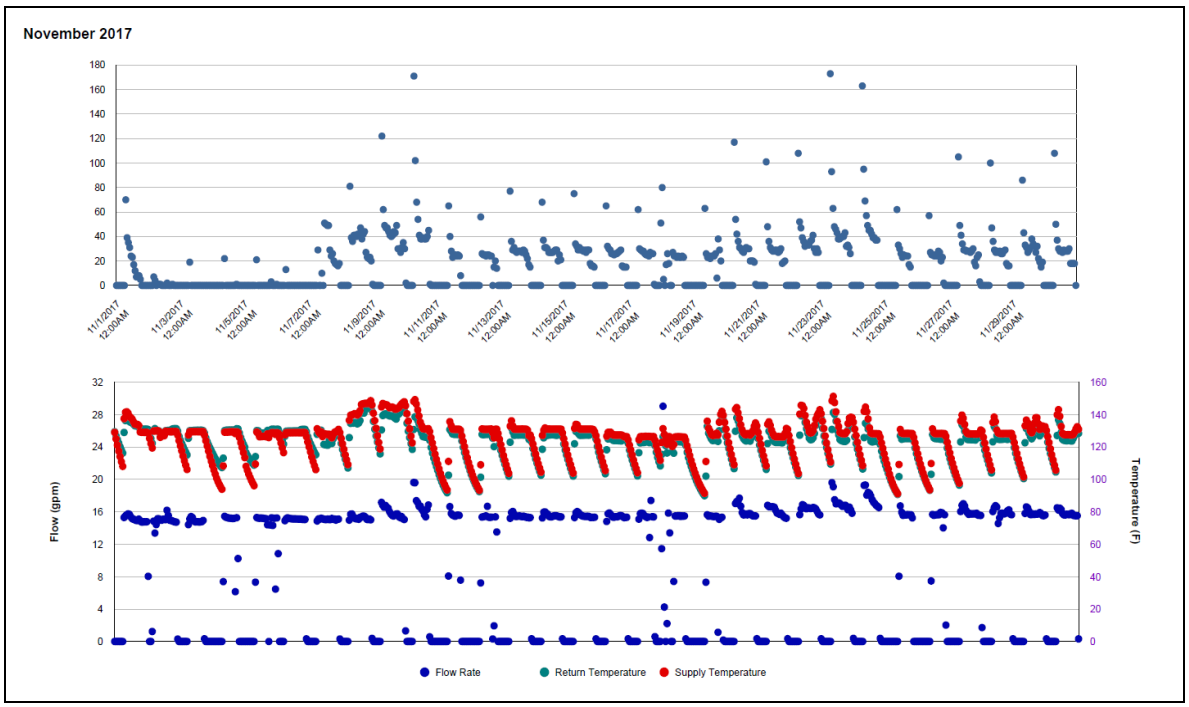
Quantitative descriptions and comments

For 11/1/2017 – 11/7/2017, the HHW consumption decreased to zero except for an occasional spike. During this period, the return temperature appears to be slightly higher than the supply temperature causing the delta-T to be negative. Although not a constant issue for an entire month, this behavior has been present in each month since July 2017. The HHW consumption was estimated by model for this period.

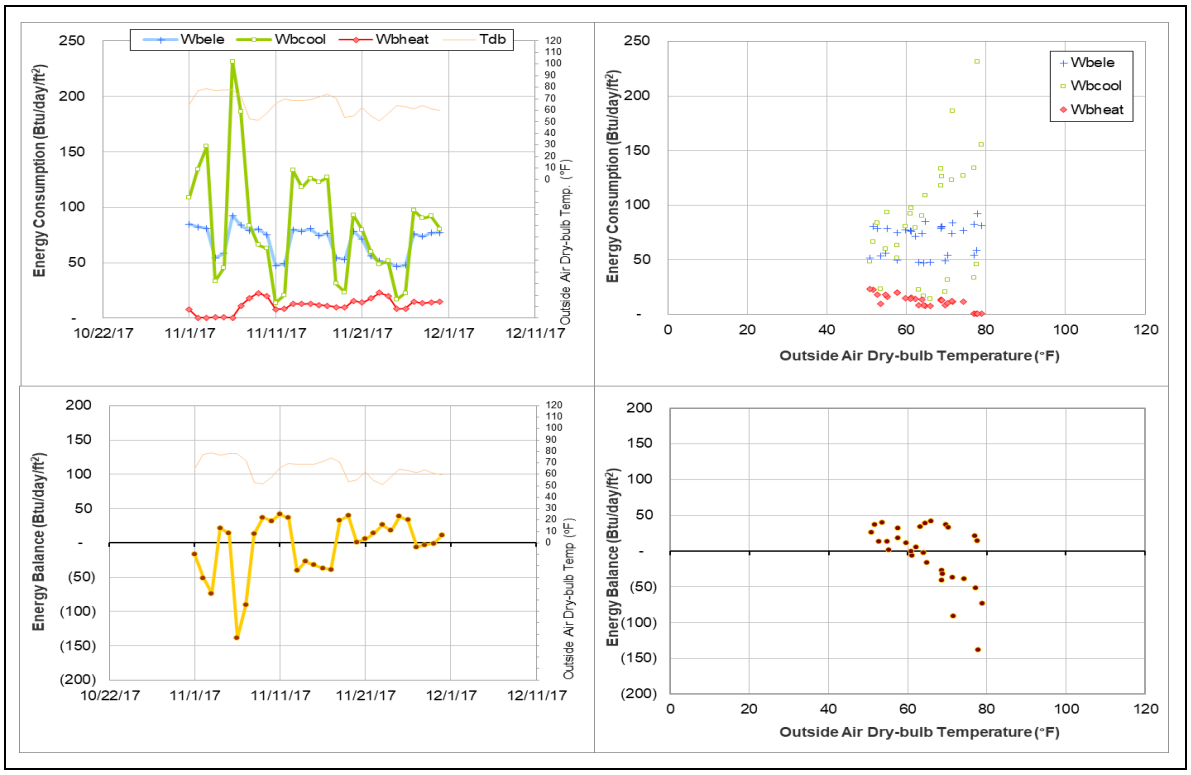
Explanatory Figure: 13 months energy balance plot with original data



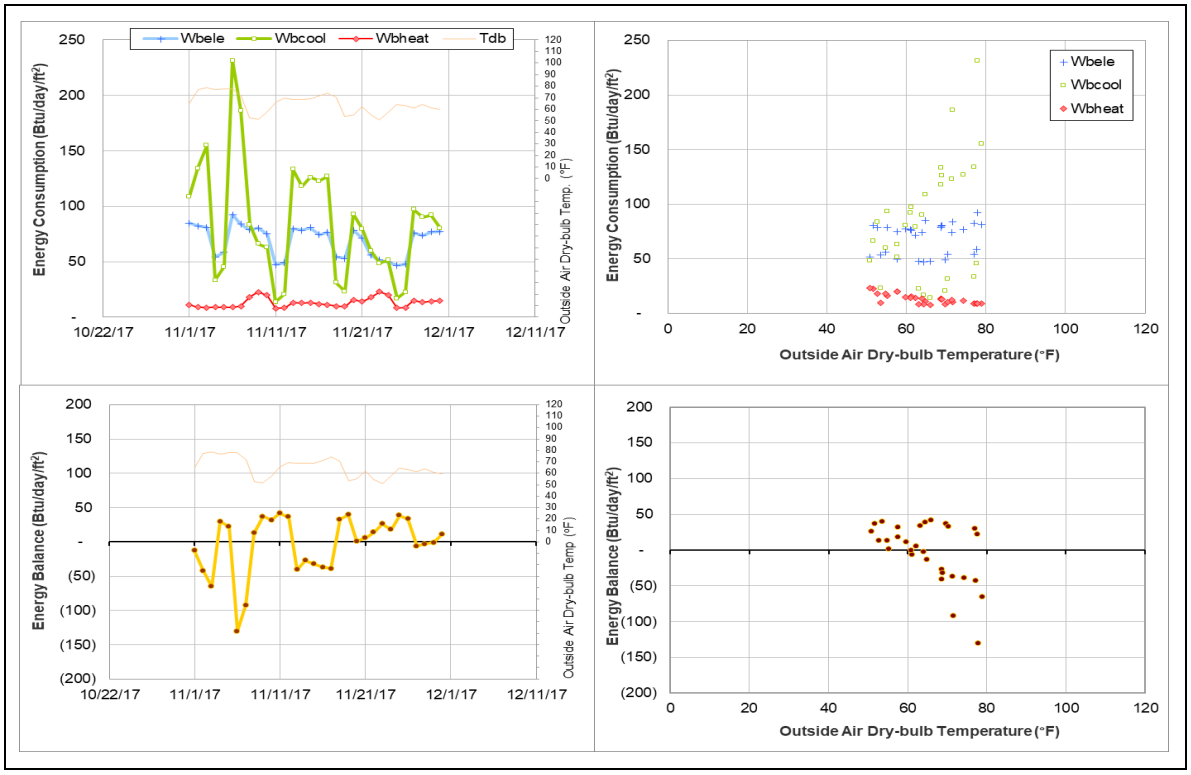
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office (HHW meter during November 2017)



Energy balance plot using the original data for the month of analysis. Missing data have been filled in, if any.



Energy balance plot using the estimated data for the month of analysis



Anthropology Building (TAMU Bldg #477)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
CHW	003664	30	11/1/2017 – 11/30/2017	Model
HHW	003668	30	11/1/2017 – 11/30/2017	Model

Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
CHW	The consumption level is higher than the level during the past year.	9/27/2017 – Ongoing
HHW	The consumption level is higher than the level during the past year.	8/24/2017 – Ongoing

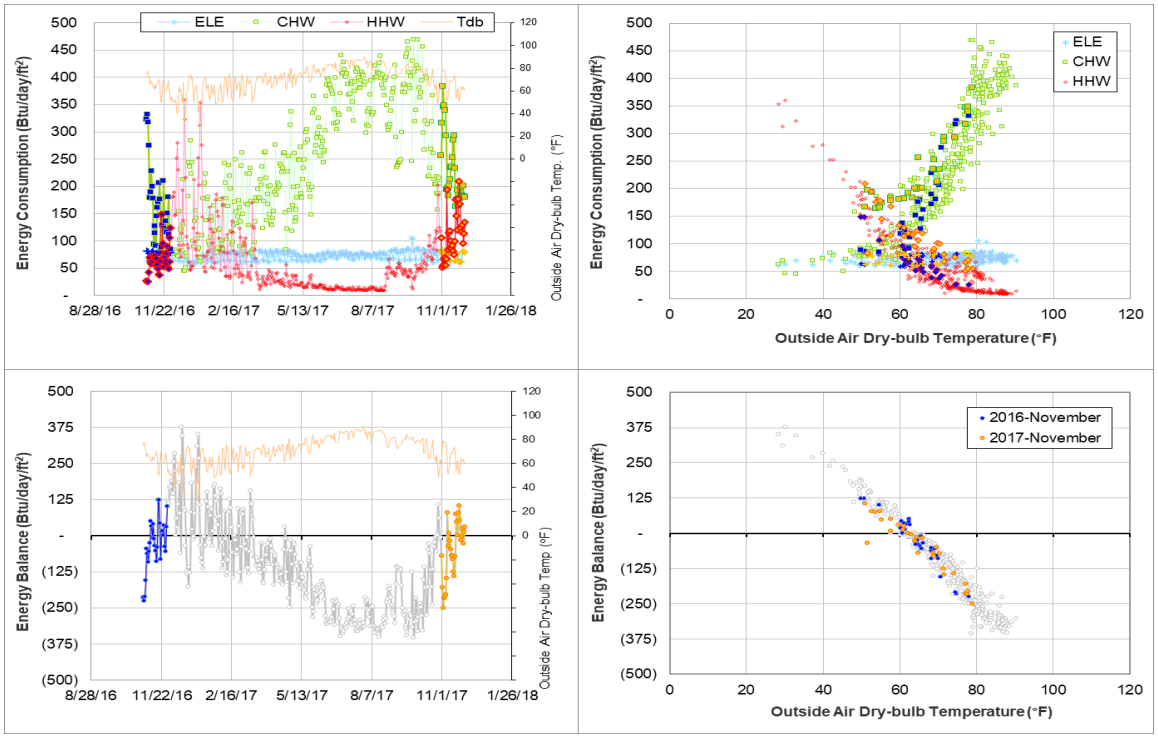
Changes in sensor readings related to the detected issues

Energy Type	Meter ID	Period	Type	Description
CHW	003664	9/27/2017 – Ongoing	Flow Rate	Increased
HHW	003668	8/24/2017 – Ongoing	Delta-T	Increased

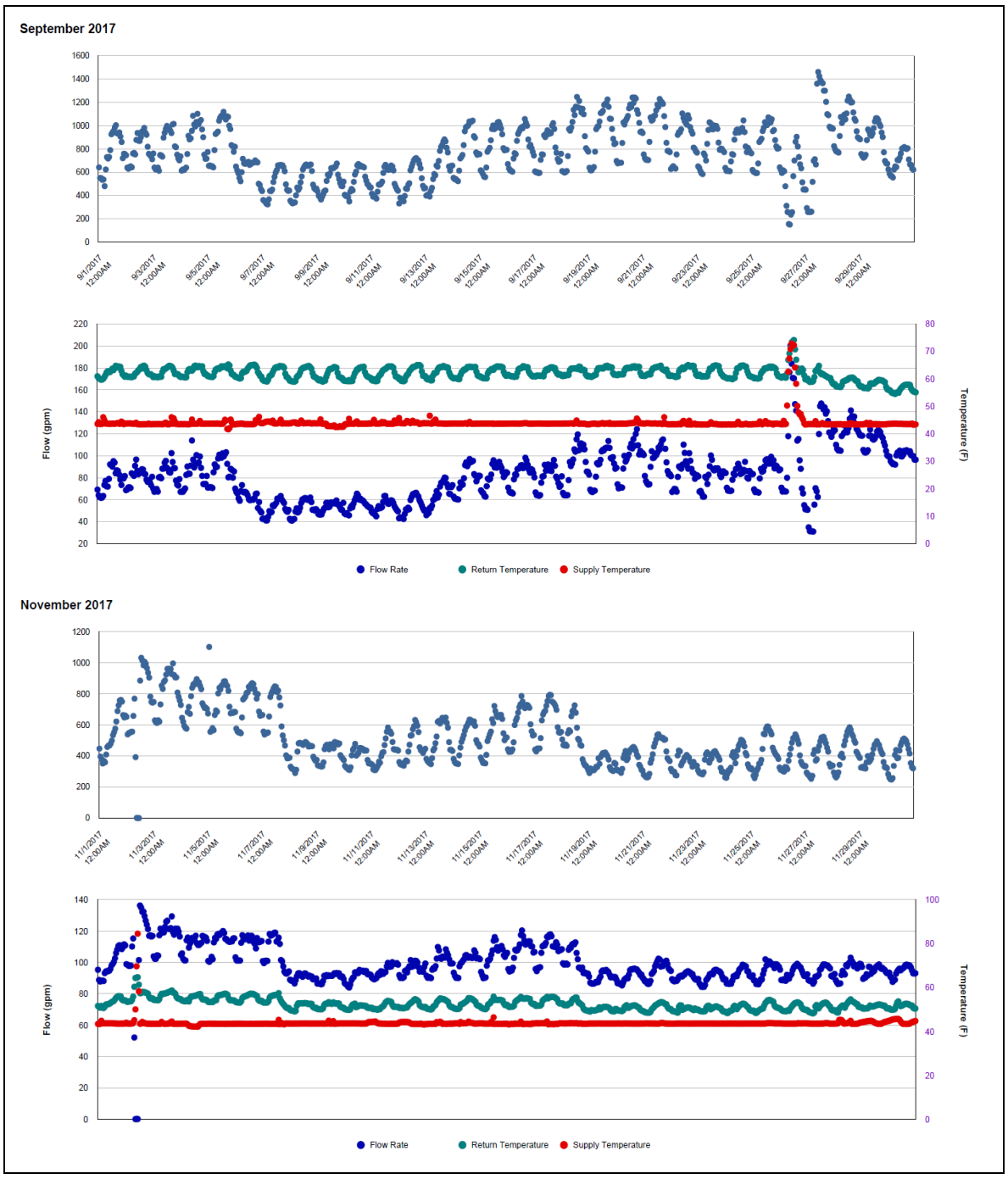
Quantitative descriptions and comments

The CHW consumption pattern has increased starting 9/27/2017. Compared to November 2016, the CHW pattern increased in the cooler temperatures (< 65°F) by 20 – 75 Btu/day/ft^2. This increase seems related to an increase in CHW flow rate. The CHW consumption was estimated by model for the month. The HHW consumption pattern also increased starting 8/24/2017. Compared to November 2016, the HHW pattern increased by 30 – 60 Btu/day/ft^2. It seems the HHW Delta-T increased around this time. The HHW consumption was estimated by model for the month.

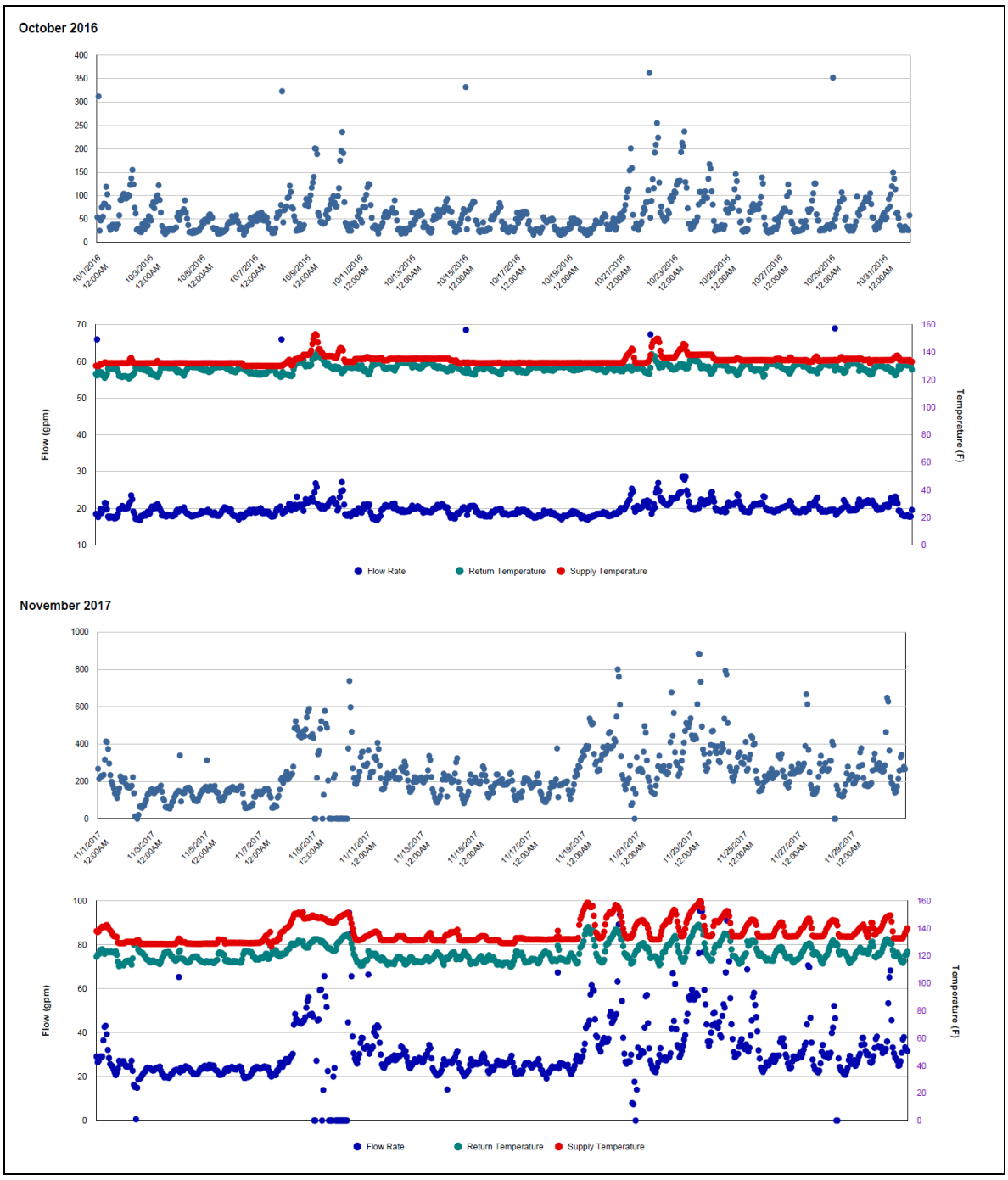
Explanatory Figure: 13 months energy balance plot with original data



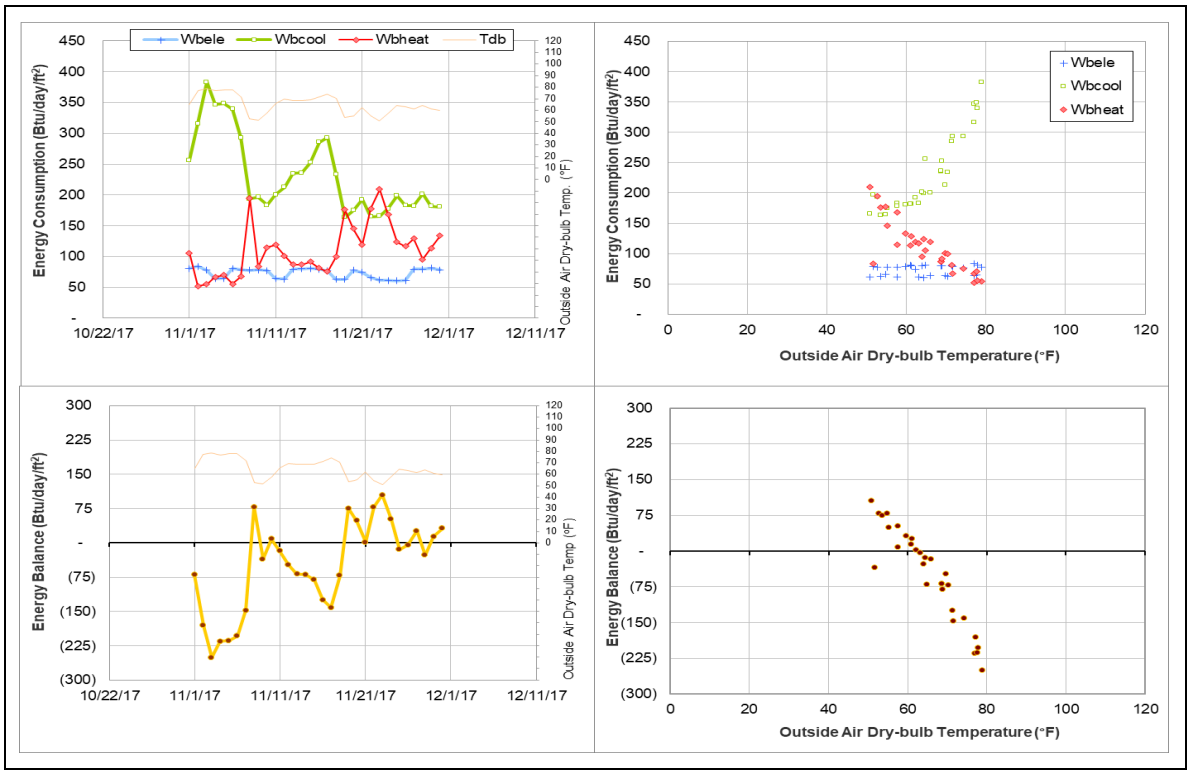
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office (CHW meter during September 2017 (top) and November 2017 (bottom))



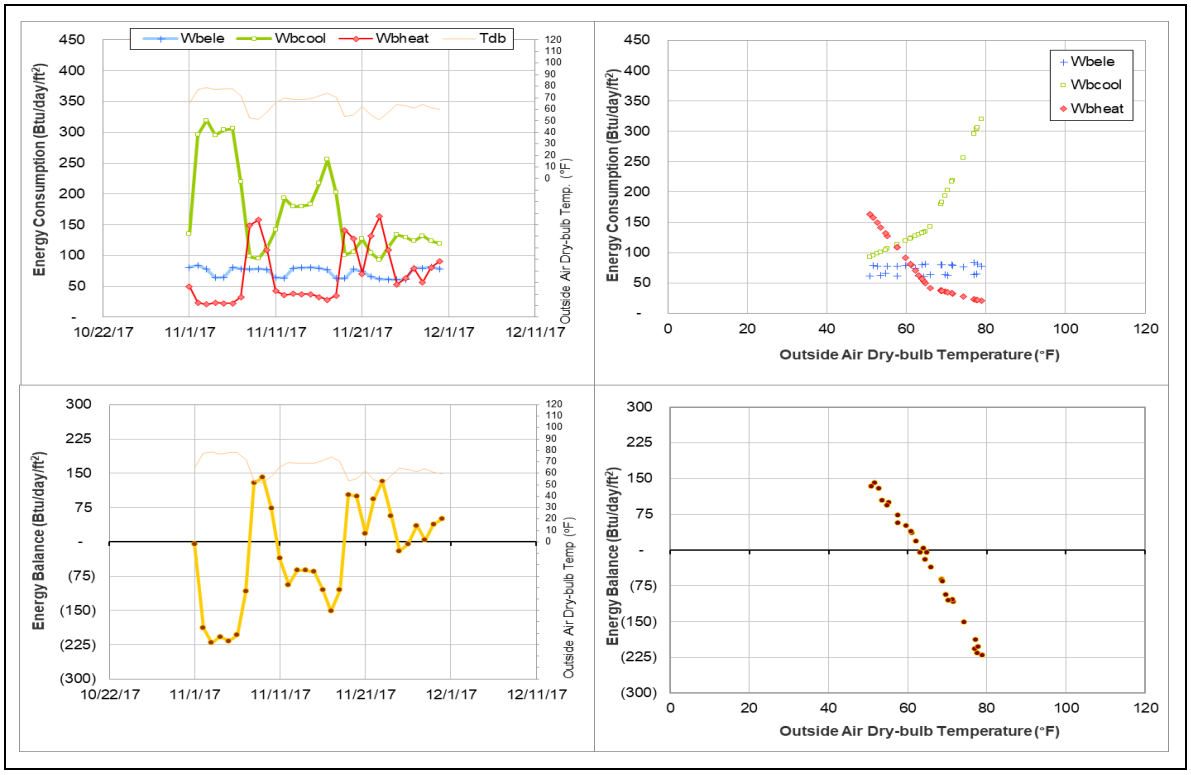
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office (HHW meter during October 2016 (top) and November 2017 (bottom))



Energy balance plot using the original data for the month of analysis. Missing data have been filled in, if any.



Energy balance plot using the estimated data for the month of analysis



Beutel Health Center (TAMU Bldg #520)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
CHW	003933	30	11/1/2017 – 11/30/2017	Model

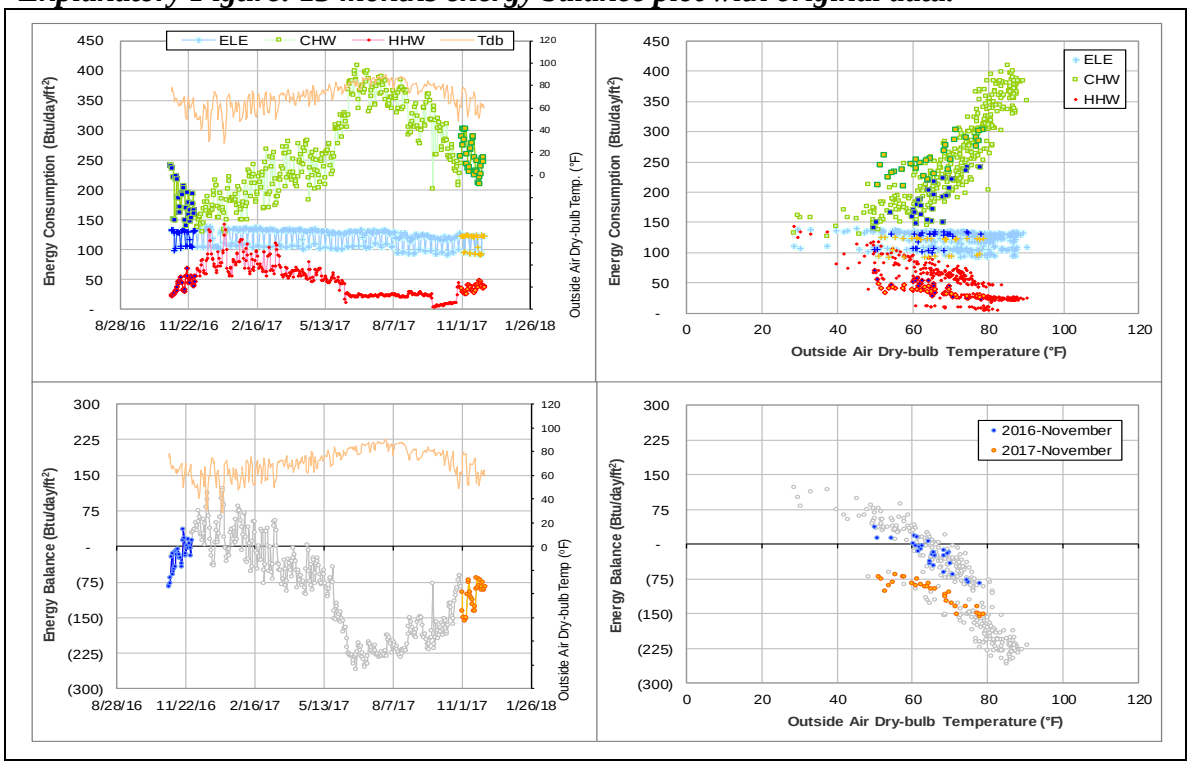
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
CHW	The consumption level is higher than the level during the past year.	6/1/2017 – Ongoing

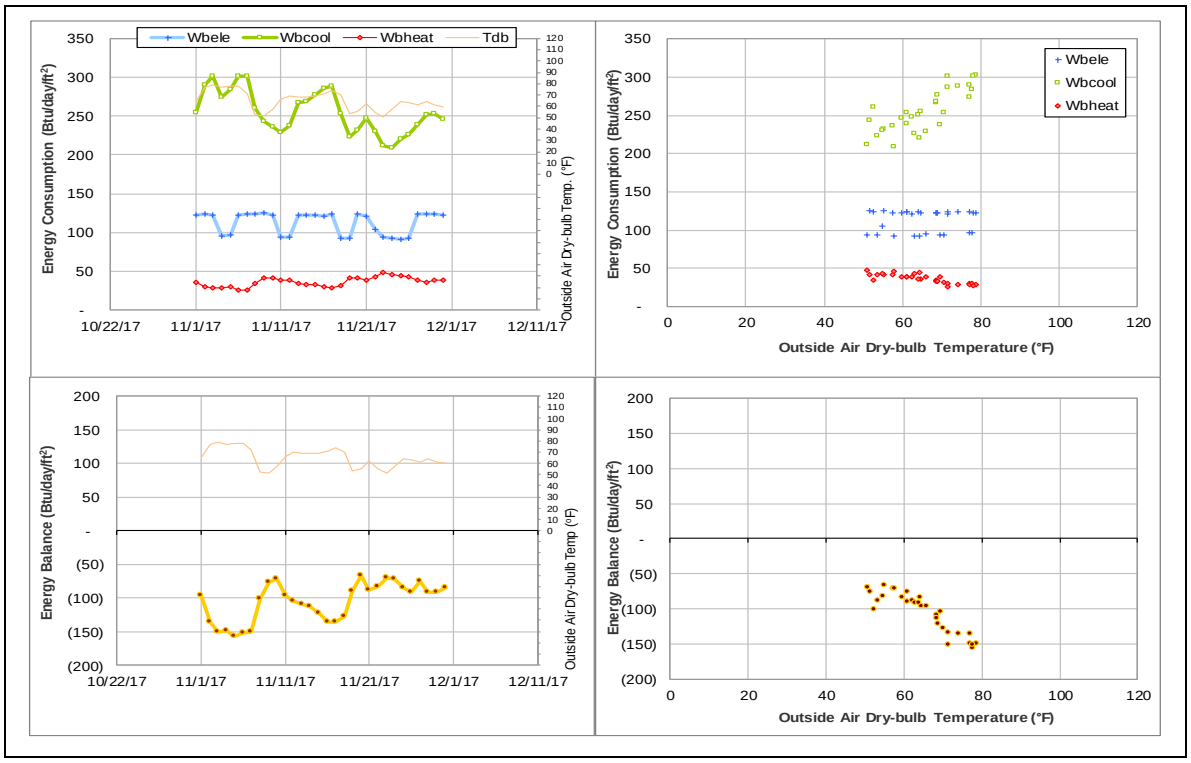
Quantitative descriptions and comments

Since June 2017, CHW consumption increased to 50 – 100 Btu/day/ft² higher than the previous year. The consumption pattern of CHW no longer has a weekday/weekend difference. There is no obvious meter reading anomaly observed. The consumption of this month is estimated by model. See also II-3.

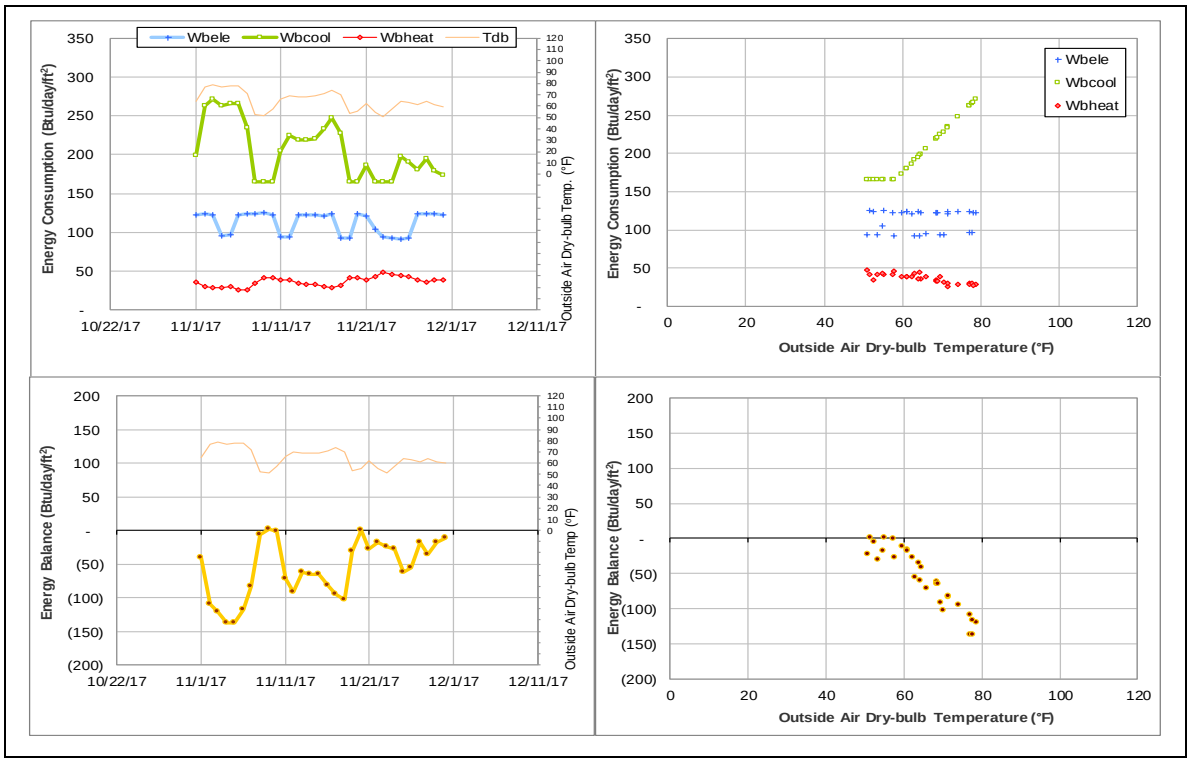
Explanatory Figure: 13 months energy balance plot with original data.



Energy balance plot using the original data for the month of analysis. Missing data have been filled in, if any.



Energy balance plot using the estimated data for the month of analysis



Haas Residence Hall (TAMU Bldg #549)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
HHW	002994	30	11/1/2017 – 11/30/2017	Model

Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
HHW	The consumption level has decreased suddenly.	9/26/2017 – Ongoing

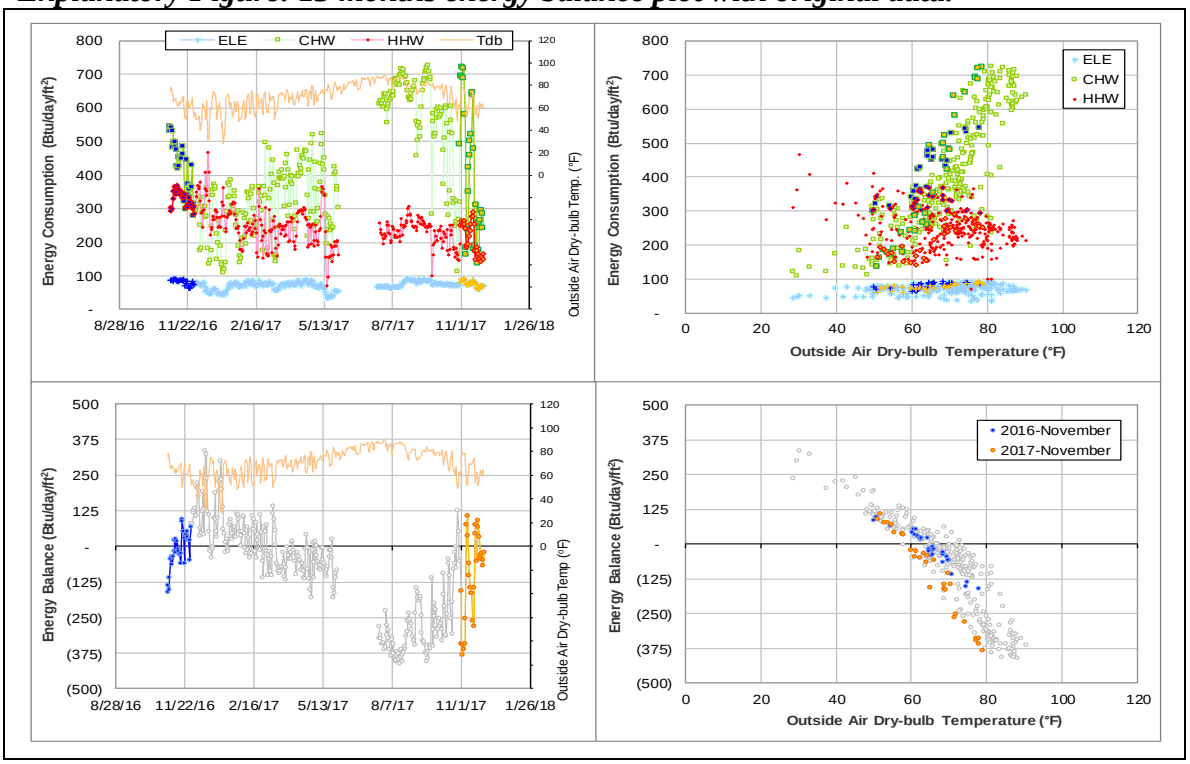
Changes in sensor readings related to the detected issues

Energy Type	Meter ID	Period	Type	Description
HHW	002994	9/26/2017 – Ongoing	Flow rate	Low
			Supply and return temp	Fluctuating

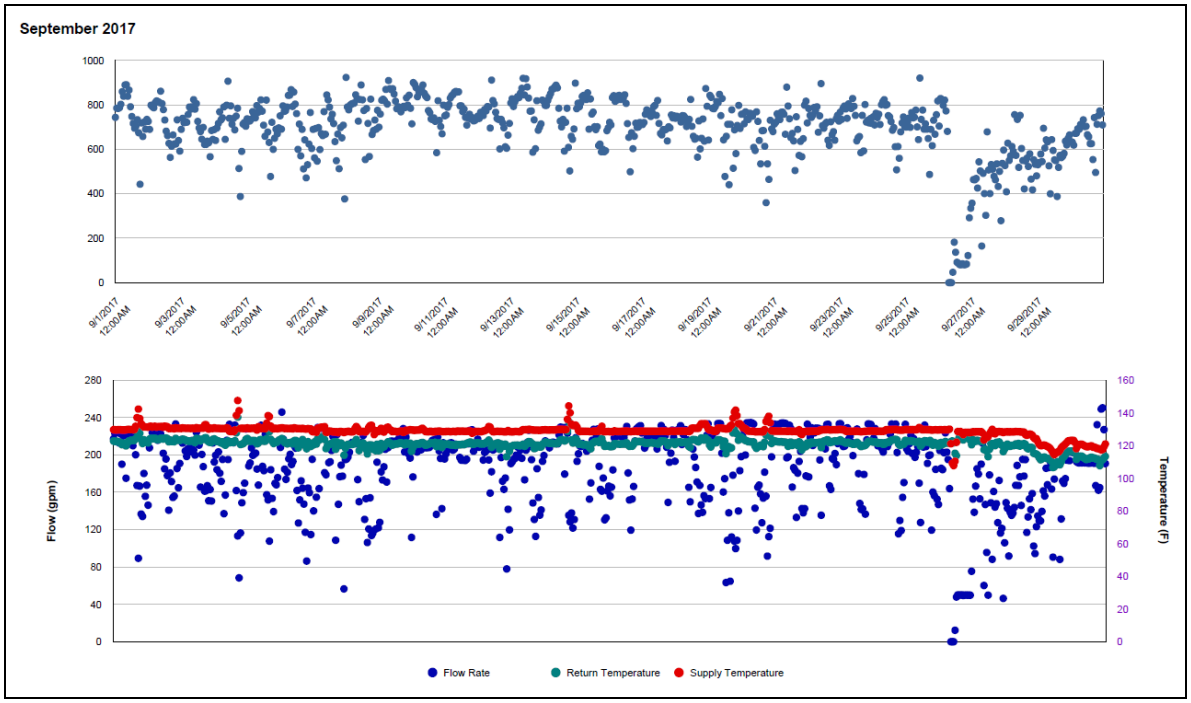
Quantitative descriptions and comments

HHW flow rate decreased on 9/26/2017 which may have been caused by the plant outage. The flow rate was around 220 gpm before the incident and became mostly lower than 220 gpm after the incident. The supply and return temperatures of HHW have been fluctuating after the incident. Consumption of this month is estimated by model.

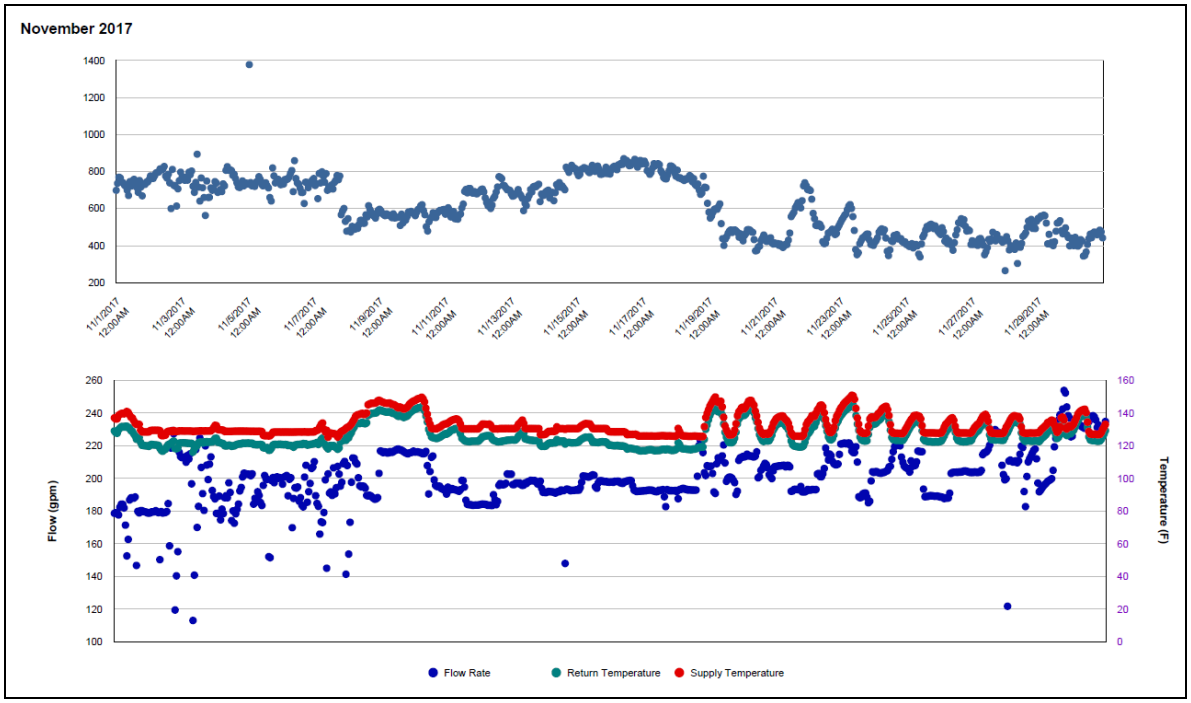
Explanatory Figure: 13 months energy balance plot with original data.



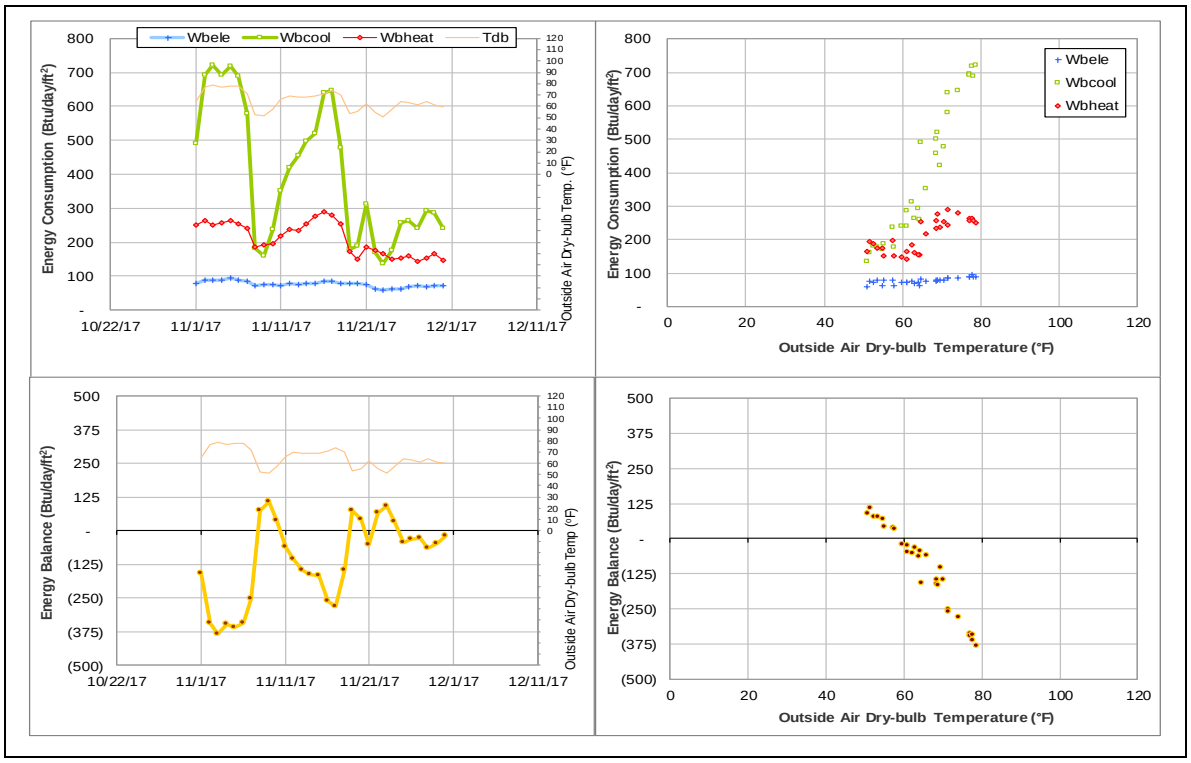
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office. (HHW during September 2017)



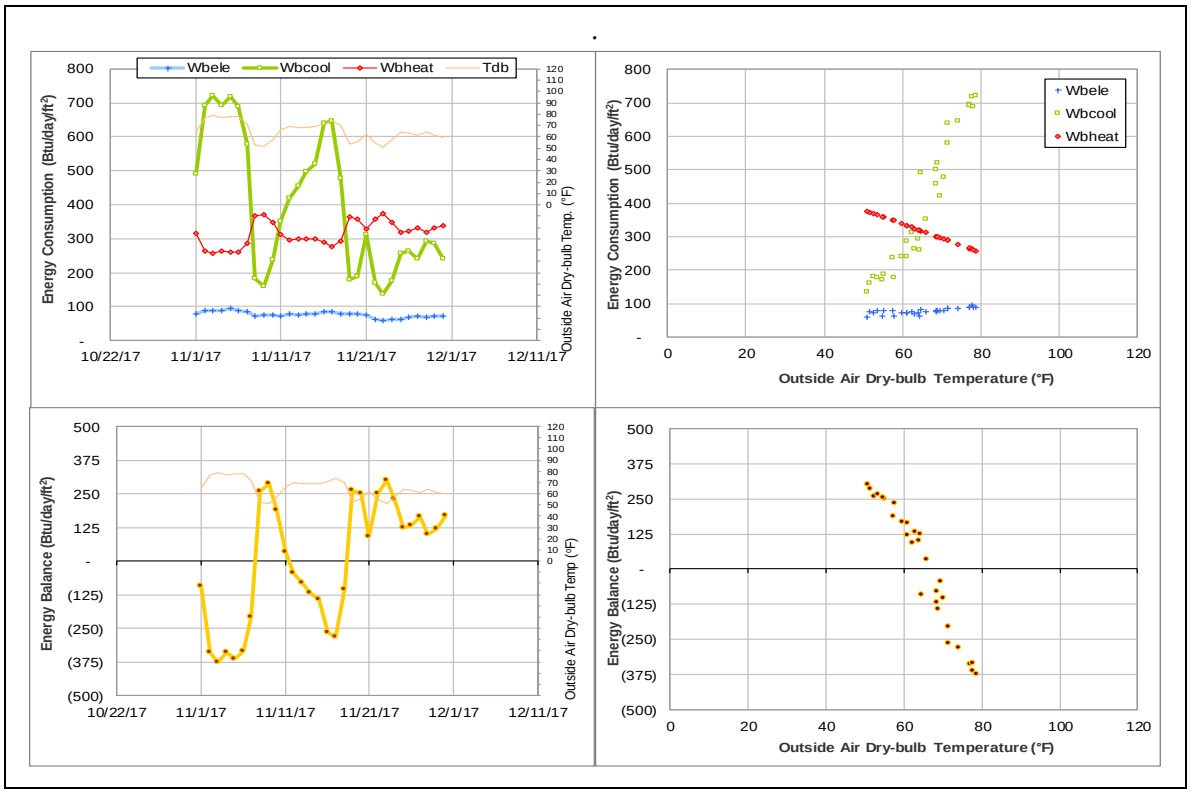
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office. (HHW during November 2017)



Energy balance plot using the original data for the month of analysis. Missing data have been filled in, if any.



Energy balance plot using the estimated data for the month of analysis



Hullabaloo Residence Hall (TAMU Bldg #1416)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
ELE	007845	1	11/14/2017	Model

Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
ELE	The metered values appear to be faulty.	11/14/2017

Quantitative descriptions and comments

ELE meter of this building was reset on 11/14/2017 06:00AM and generated a negative value. This day was estimated by model.

Explanatory Figure: Hourly consumption readings

Time Stamp	Cumulative	Interval	MID
11/13/2017 08:00:00 PM	9997544	327	007845
11/13/2017 09:00:00 PM	9997853	309	007845
11/13/2017 10:00:00 PM	9998167	314	007845
11/13/2017 11:00:00 PM	9998467	300	007845
11/14/2017 12:00:00 AM	9998763	296	007845
11/14/2017 01:00:00 AM	9999033	270	007845
11/14/2017 02:00:00 AM	9999275	242	007845
11/14/2017 03:00:00 AM	9999492	217	007845
11/14/2017 04:00:00 AM	9999699	207	007845
11/14/2017 05:00:00 AM	9999902	203	007845
11/14/2017 06:00:00 AM	104	-9999798	007845
11/14/2017 07:00:00 AM	313	209	007845
11/14/2017 08:00:00 AM	531	219	007845
11/14/2017 09:00:00 AM	785	254	007845
11/14/2017 10:00:00 AM	1055	270	007845
11/14/2017 11:00:00 AM	1329	275	007845
11/14/2017 12:00:00 PM	1611	282	007845
11/14/2017 01:00:00 PM	1907	296	007845
11/14/2017 02:00:00 PM	2210	303	007845
11/14/2017 03:00:00 PM	2514	303	007845
11/14/2017 04:00:00 PM	2808	295	007845

Kleberg Center (TAMU Bldg #1501)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
HHW	002628	6	11/6/2017 11/13/2017 – 11/17/2017	Model

Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
HHW	The consumption dropped for a short period.	11/6/2017 11/13/2017 – 11/17/2017

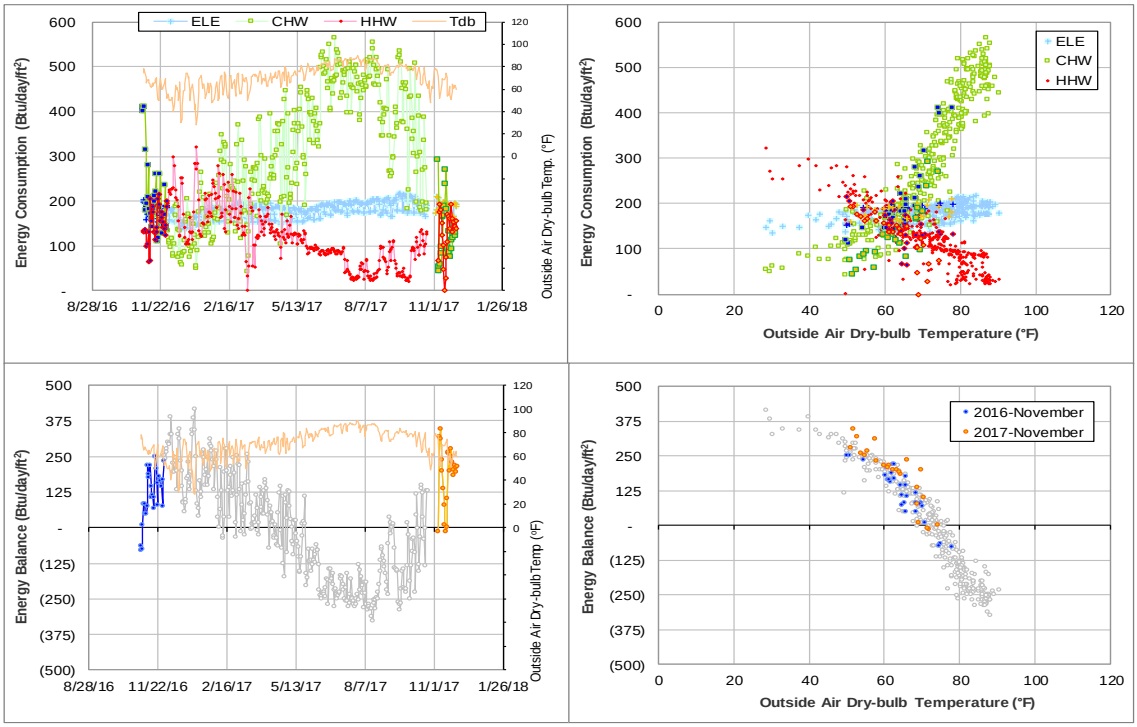
Changes in sensor readings related to the detected issues

Energy Type	Meter ID	Period	Type	Description
HHW	002628	11/6/2017	Flow rate	Low
		11/13/2017 – 11/17/2017	Flow rate	Zero

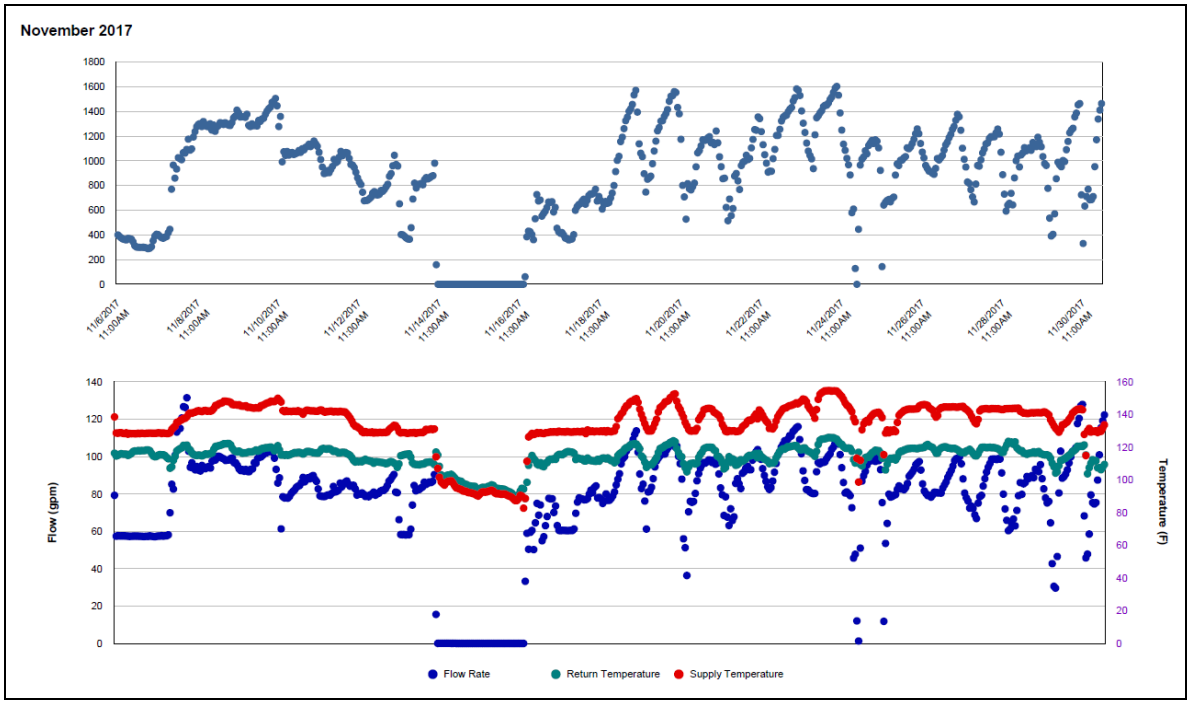
Quantitative descriptions and comments

After the missing period of 10/25/2017 – 11/5/2017, HHW flow rate stayed very low at 60 gpm on 11/6/2017. The flow rate of this MID constantly fluctuates between 60 gpm and 80 gpm. The flow rate dropped to zero during 11/13/2017 – 11/17/2017. The affected days are estimated by model.

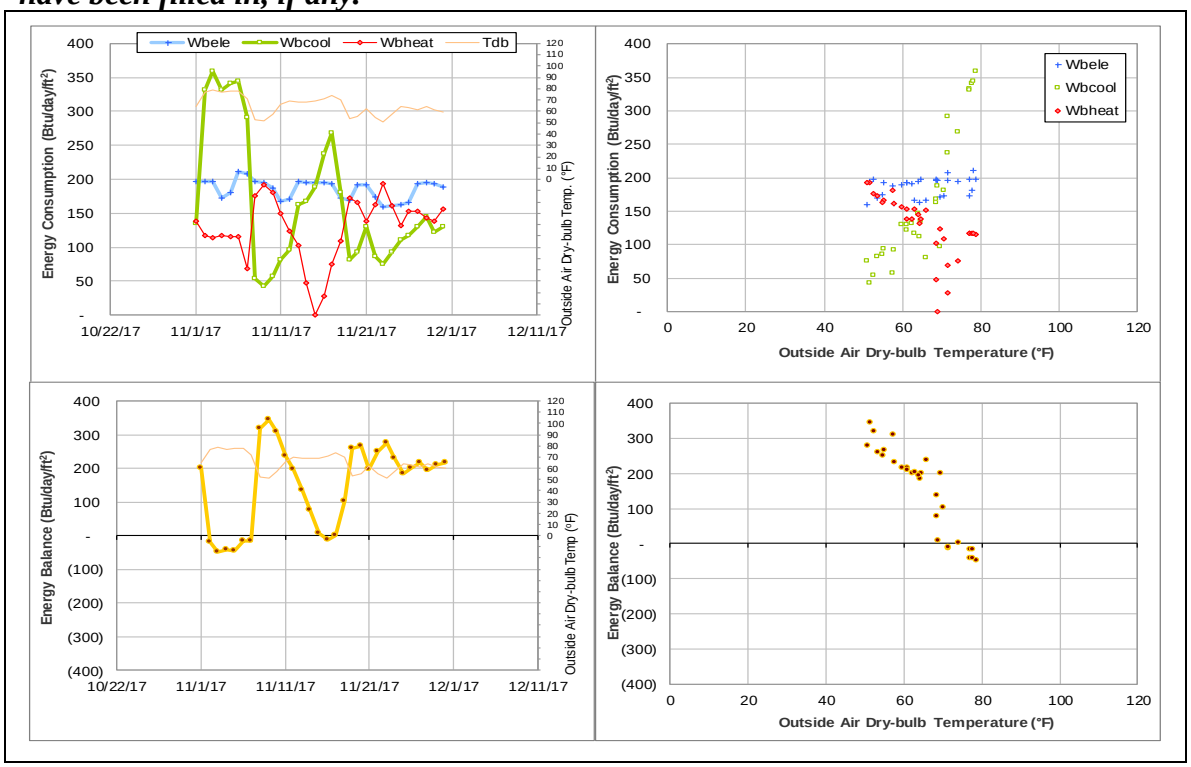
Explanatory Figure: 13 months energy balance plot with original data



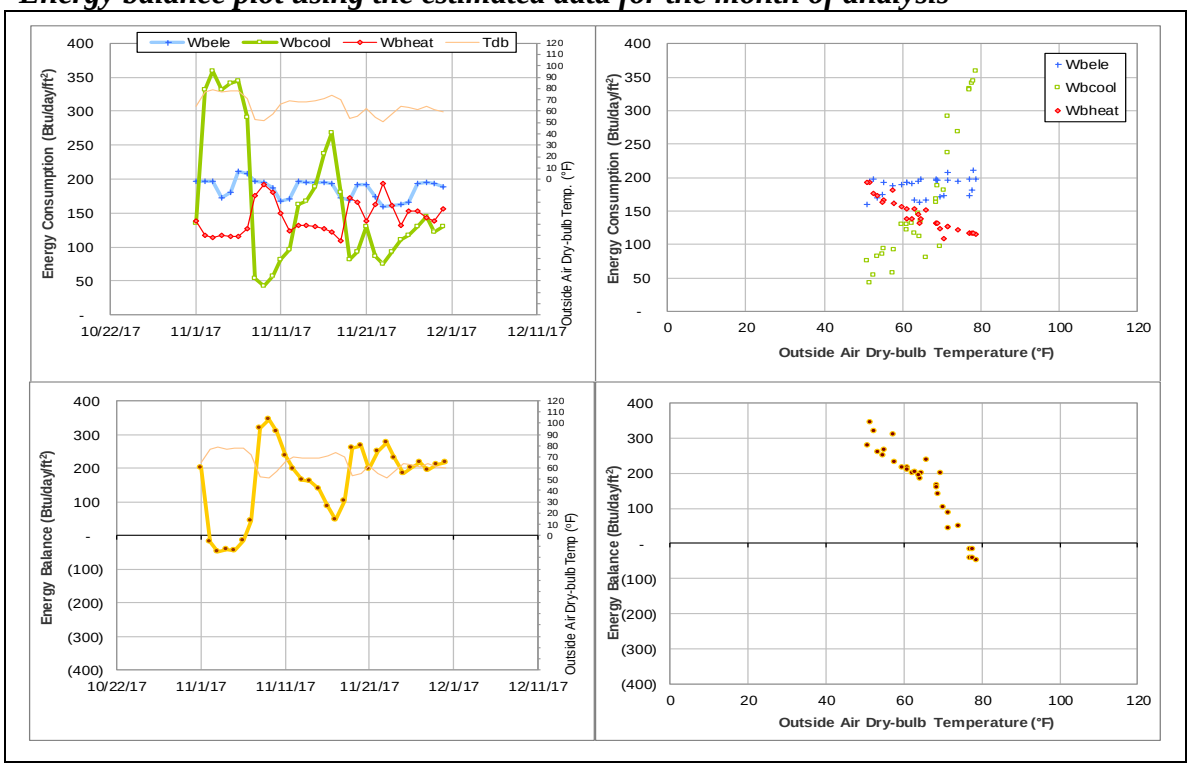
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office. (HHW during November 2017)



Energy balance plot using the original data for the month of analysis. Missing data have been filled in, if any.



Energy balance plot using the estimated data for the month of analysis



Southern Crop Improvement Greenhouse (TAMU Bldg #1512)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
ELE	005931	30	11/1/2017 – 11/30/2017	Model

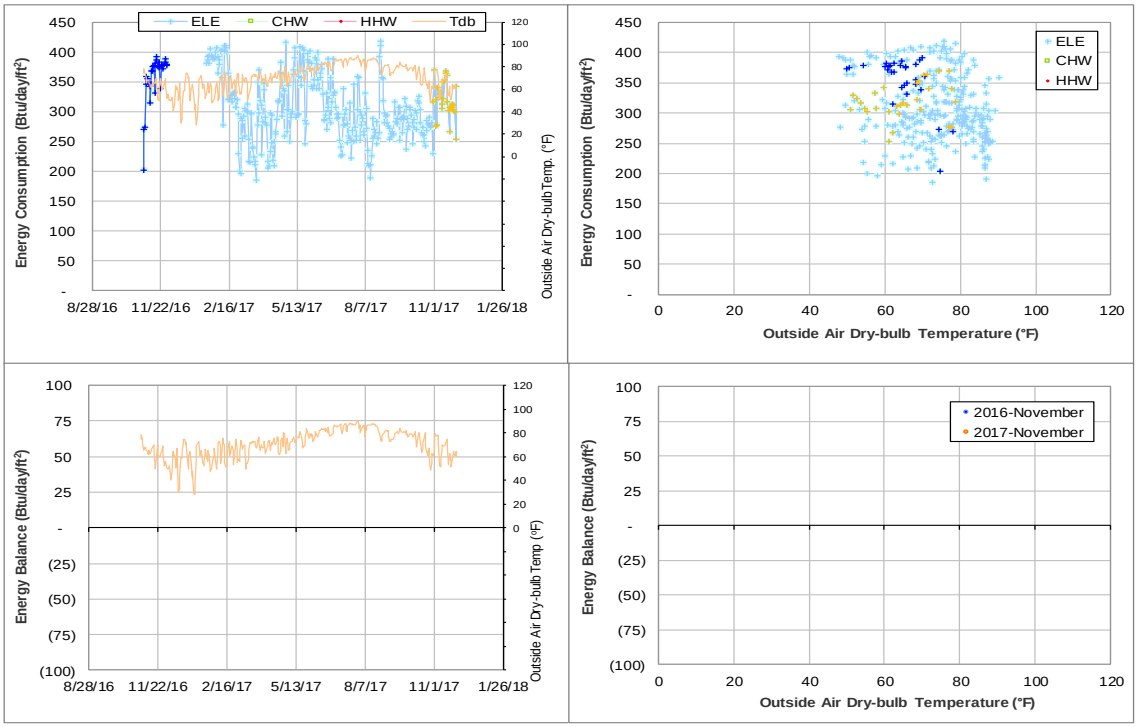
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
ELE	The ELE consumption increased.	1/19/2017 – Ongoing

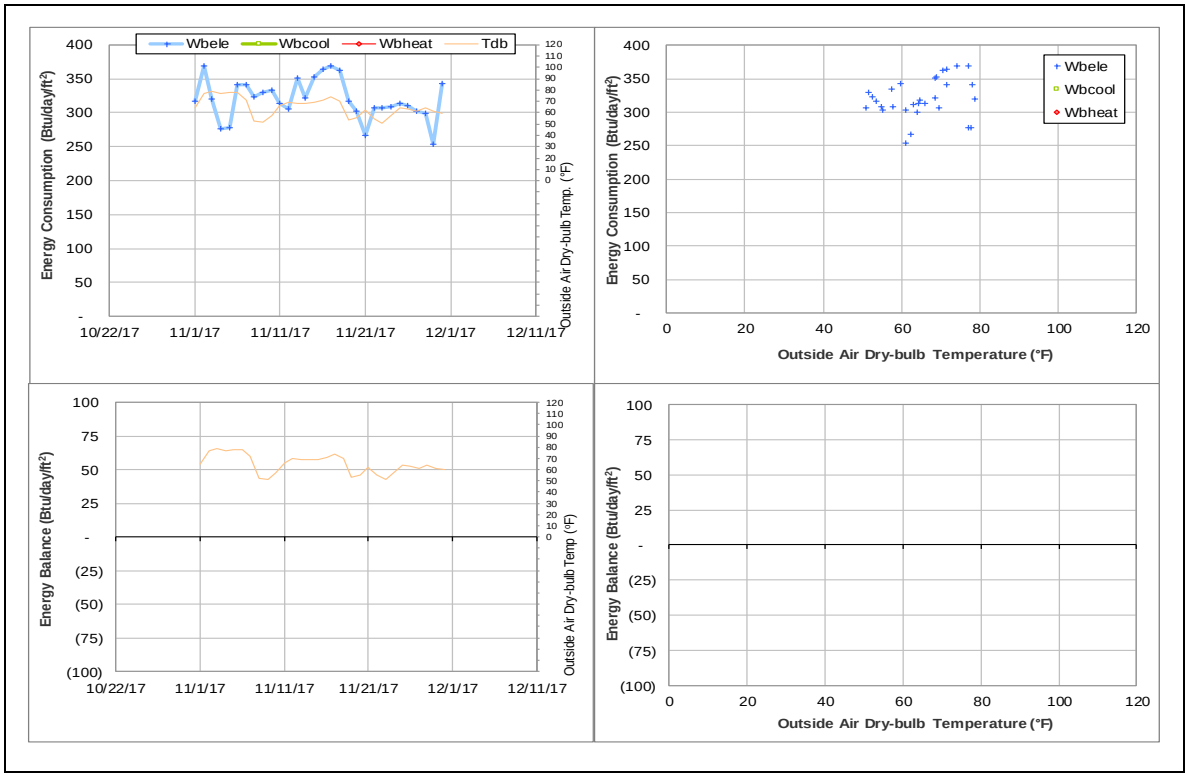
Quantitative descriptions and comments

The ELE consumption level has changed frequently since July 2015 as shown in the time series. During the period of 1/22/2017 – 2/15/2017 it increased to the higher consumption pattern but then dropped again. The ELE consumption is estimated using a model based on data during 7/1/2014 – 6/30/2015 when the consumption was stable.

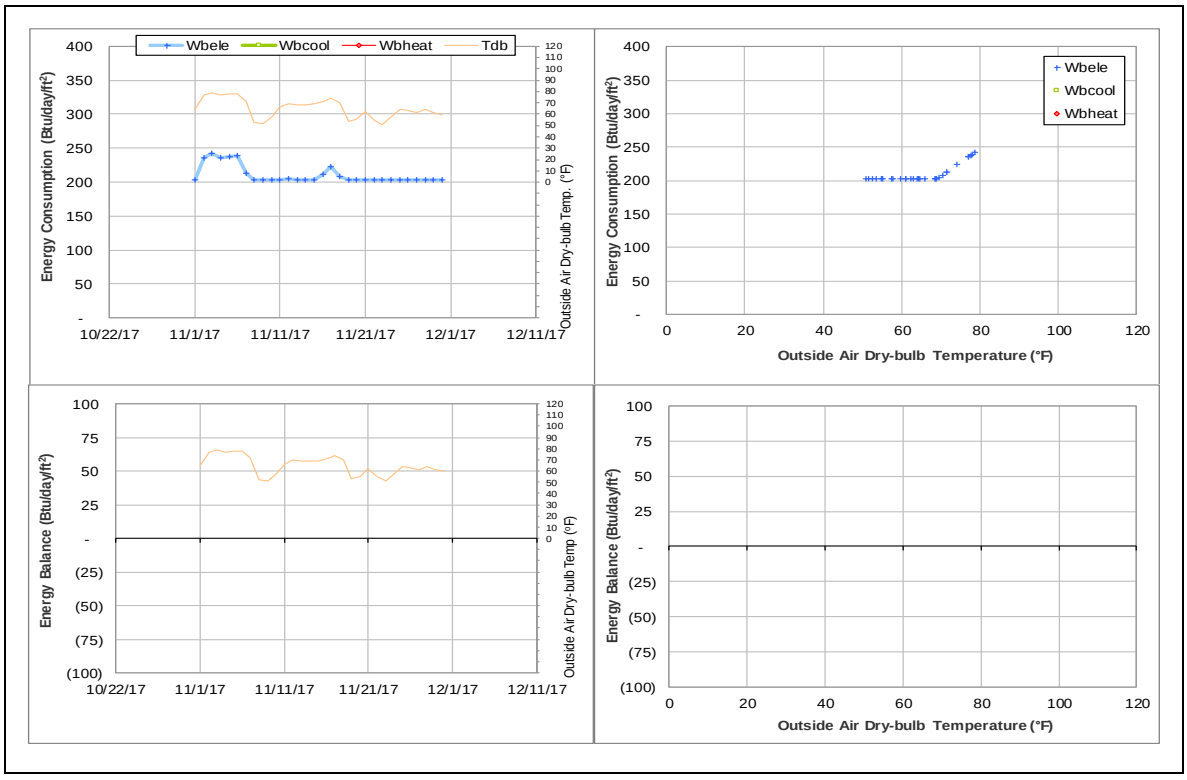
Explanatory Figure: 13 months energy balance plot with original data



Energy balance plot using the original data for the month of analysis. Missing data have been filled in, if any.



Energy balance plot using the estimated data for the month of analysis.



TX School of Rural Public Health (TAMU Bldg # 1518, 1519, 1520)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
ELE	005274	30	11/1/2017 – 11/30/2017	Switch with 005275
ELE	005275	30	11/1/2017 – 11/30/2017	Switch with 005274

Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
ELE (005274)	The consumption level increased largely.	8/14/2015 - ongoing
ELE (005275)	The consumption level decreased largely.	8/14/2015 - ongoing

Comments

ELE meter ID# 005274 serves TX School of Rural Public Health B and ELE meter ID# 005275 is for TX School of Rural Public Health C.

The ELE consumption levels for these two meters had a sudden change on 8/14/2015. The consumption level for meter ID# 005274 increased by approximate 80 kWh/h (~ 100%) and the consumption level for meter ID# 005275 decreased by around 80 kWh/h (~50%). The change observed on 8/14/2015 12:00 AM (see below explanatory figure) suggests that the two meters were switched and may need to be investigated.

Explanatory Figure: Hourly consumption readings for two ELE meters #005274 and# 005275

Time	Cumulative reading	Hourly Consumption	MeterID		Time	Cumulative reading	Hourly Consumption	MeterID
08/13/2015 12:00:00 PM	2930884.013	84.262	005274		08/13/2015 12:00:00 PM	4741958.002	170.658	005275
08/13/2015 01:00:00 PM	2930968.589	84.576	005274		08/13/2015 01:00:00 PM	4742132.336	174.334	005275
08/13/2015 02:00:00 PM	2931051.959	83.37	005274		08/13/2015 02:00:00 PM	4742303.554	171.218	005275
08/13/2015 03:00:00 PM	2931146.799	94.84	005274		08/13/2015 03:00:00 PM	4742483.683	180.129	005275
08/13/2015 04:00:00 PM	2931240.505	93.706	005274		08/13/2015 04:00:00 PM	4742662.753	179.07	005275
08/13/2015 05:00:00 PM	2931324.169	83.664	005274		08/13/2015 05:00:00 PM	4742832.009	169.256	005275
08/13/2015 06:00:00 PM	2931399.91	75.741	005274		08/13/2015 06:00:00 PM	4742993.53	161.521	005275
08/13/2015 07:00:00 PM	2931472.181	72.271	005274		08/13/2015 07:00:00 PM	4743149.675	156.145	005275
08/13/2015 08:00:00 PM	2931543.838	71.657	005274		08/13/2015 08:00:00 PM	4743305.9	156.225	005275
08/13/2015 09:00:00 PM	2931613.306	69.468	005274		08/13/2015 09:00:00 PM	4743462.097	156.197	005275
08/13/2015 10:00:00 PM	2931672.706	59.4	005274		08/13/2015 10:00:00 PM	4743610.221	148.124	005275
08/13/2015 11:00:00 PM	2931733.072	60.366	005274		08/13/2015 11:00:00 PM	4743745.645	135.424	005275
08/14/2015 12:00:00 AM	4743876.03	130.385	005274		08/14/2015 12:00:00 AM	2931791.19	58.118	005275
08/14/2015 01:00:00 AM	4744008.406	132.376	005274		08/14/2015 01:00:00 AM	2931849.35	58.16	005275
08/14/2015 02:00:00 AM	4744141.74	133.334	005274		08/14/2015 02:00:00 AM	2931908.534	59.184	005275
08/14/2015 03:00:00 AM	4744272.553	130.813	005274		08/14/2015 03:00:00 AM	2931966.686	58.152	005275
08/14/2015 04:00:00 AM	4744404.045	131.492	005274		08/14/2015 04:00:00 AM	2932023.589	56.903	005275
08/14/2015 05:00:00 AM	4744534.38	130.335	005274		08/14/2015 05:00:00 AM	2932080.05	56.461	005275
08/14/2015 06:00:00 AM	4744667.111	132.731	005274		08/14/2015 06:00:00 AM	2932137.05	57	005275
08/14/2015 07:00:00 AM	4744820.038	152.927	005274		08/14/2015 07:00:00 AM	2932232.983	95.933	005275
08/14/2015 08:00:00 AM	4744972.221	152.183	005274		08/14/2015 08:00:00 AM	2932319.162	86.179	005275
08/14/2015 09:00:00 AM	4745134.467	162.246	005274		08/14/2015 09:00:00 AM	2932404.691	85.529	005275
08/14/2015 10:00:00 AM	4745308.905	174.438	005274		08/14/2015 10:00:00 AM	2932489.976	85.285	005275
08/14/2015 11:00:00 AM	4745476.832	167.927	005274		08/14/2015 11:00:00 AM	2932564.419	74.443	005275
08/14/2015 12:00:00 PM	4745634.44	157.608	005274		08/14/2015 12:00:00 PM	2932634.064	69.645	005275
08/14/2015 01:00:00 PM	4745789.345	154.905	005274		08/14/2015 01:00:00 PM	2932704.723	70.659	005275
08/14/2015 02:00:00 PM	4745949.369	160.024	005274		08/14/2015 02:00:00 PM	2932777.373	72.65	005275
08/14/2015 03:00:00 PM	4746110.346	160.977	005274		08/14/2015 03:00:00 PM	2932845.908	68.535	005275
08/14/2015 04:00:00 PM	4746270.903	160.557	005274		08/14/2015 04:00:00 PM	2932920.525	74.617	005275
08/14/2015 05:00:00 PM	4746431.347	160.444	005274		08/14/2015 05:00:00 PM	2932996.835	76.31	005275
08/14/2015 06:00:00 PM	4746586.415	155.068	005274		08/14/2015 06:00:00 PM	2933065.518	68.683	005275
08/14/2015 07:00:00 PM	4746727.476	141.061	005274		08/14/2015 07:00:00 PM	2933127.559	62.041	005275
08/14/2015 08:00:00 PM	4746864.372	136.896	005274		08/14/2015 08:00:00 PM	2933195.384	67.825	005275
08/14/2015 09:00:00 PM	4747004.372	140	005274		08/14/2015 09:00:00 PM	2933263.632	68.248	005275
08/14/2015 10:00:00 PM	4747137.886	133.514	005274		08/14/2015 10:00:00 PM	2933323.26	59.628	005275
08/14/2015 11:00:00 PM	4747269.569	131.683	005274		08/14/2015 11:00:00 PM	2933382.3	59.04	005275

West Campus Parking Garage (TAMU Bldg #1559)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
HHW	004327	30	11/1/2017 – 11/30/2017	Model

Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
HHW	The consumption level has increased suddenly.	9/6/2017 – Ongoing

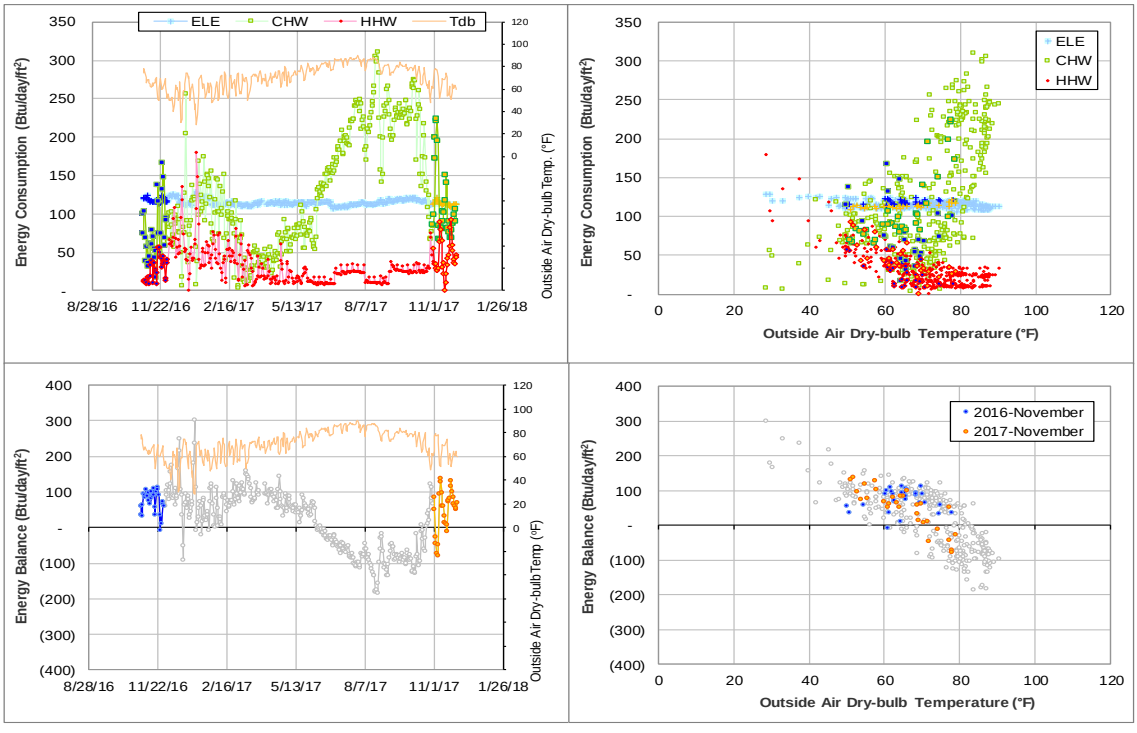
Changes in sensor readings related to the detected issues

Energy Type	Meter ID	Period	Type	Description
HHW	004327	9/6/2017 – Ongoing	Flow rate	High
		11/14/2017 – 11/16/2017	Flow rate	Zero

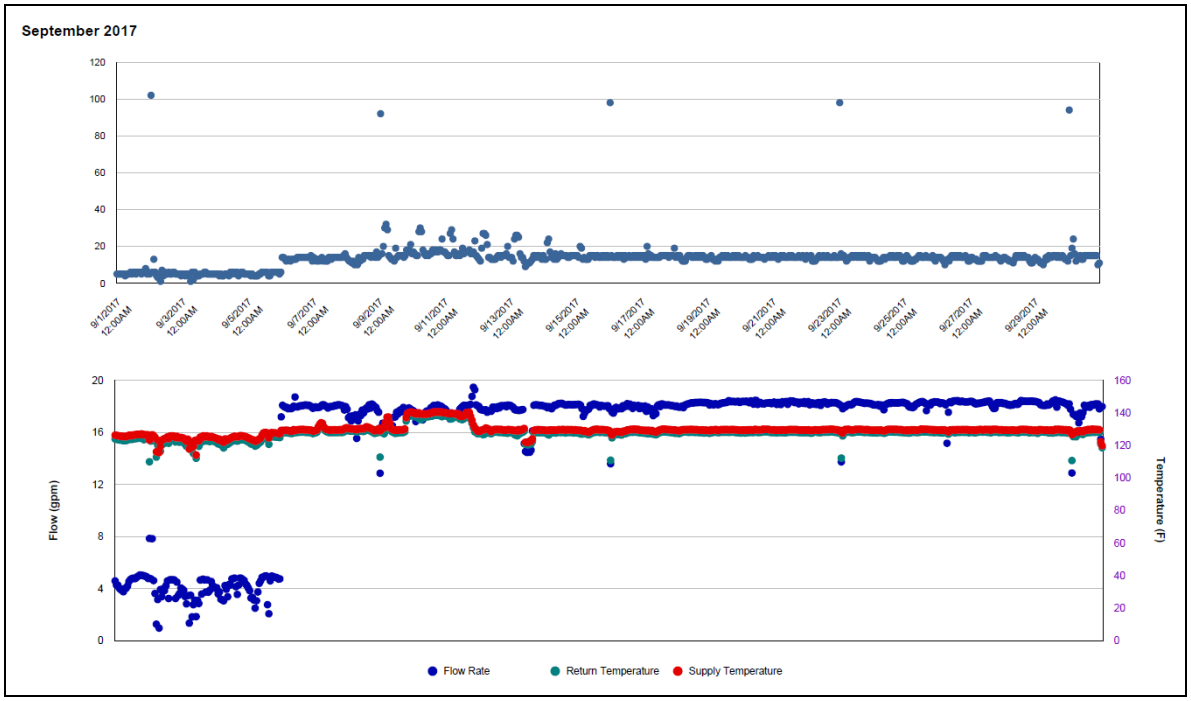
Quantitative descriptions and comments

HHW flow rate significantly increased from 2 – 6 gpm to about 18 gpm during 6/30/2017 – 8/6/2017 and since 9/6/2017. The flow rate also dropped to zero during 11/14/2017 – 11/16/2017. The consumption of the affected period is estimated using a model based on the data of 6/1/2015 – 5/31/2016.

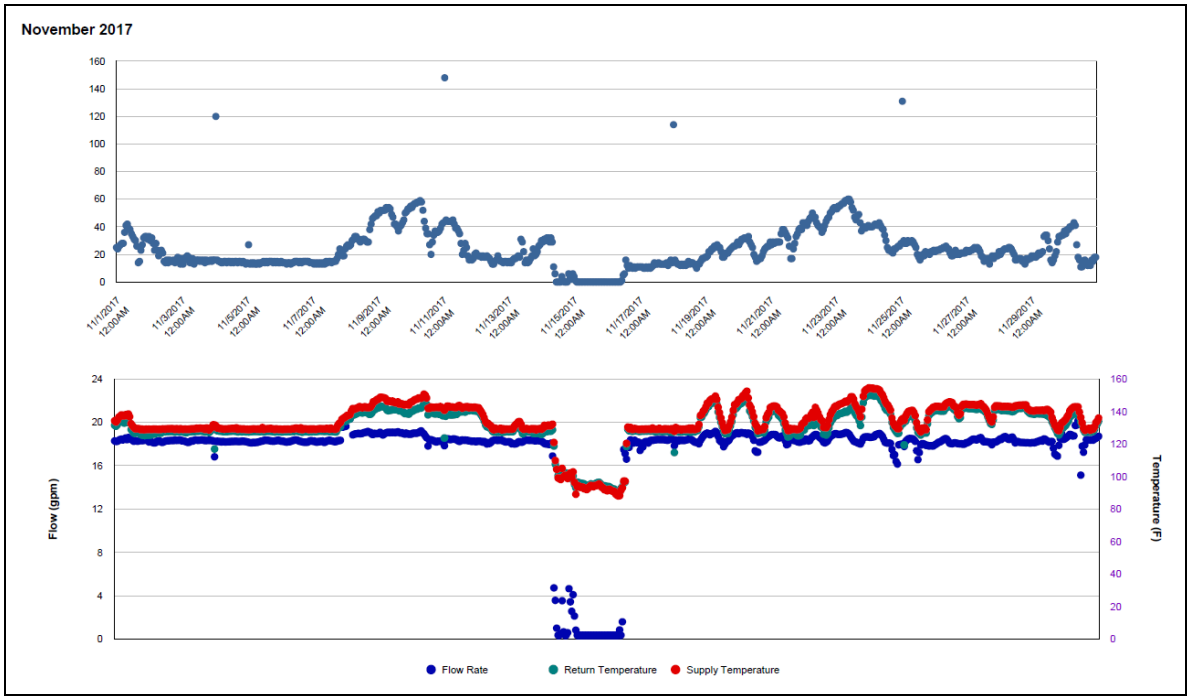
Explanatory Figure: 13 months energy balance plot with original data



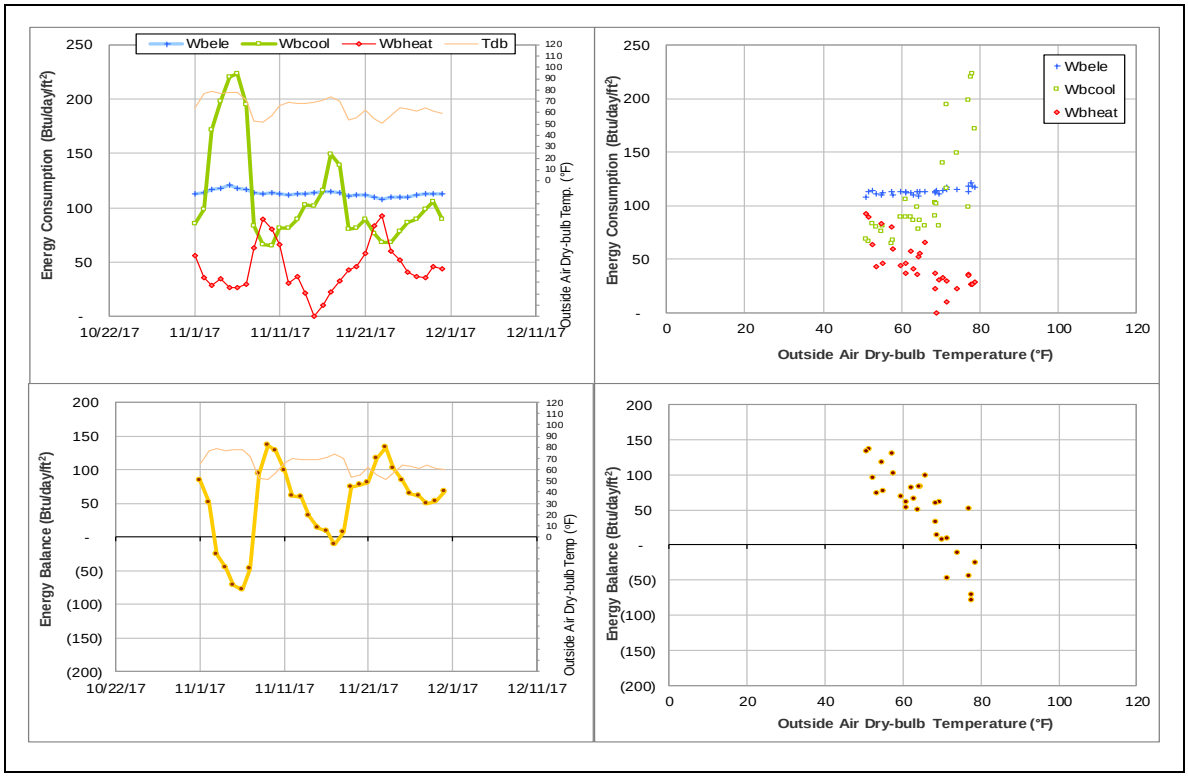
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office. (HHW during September 2017)



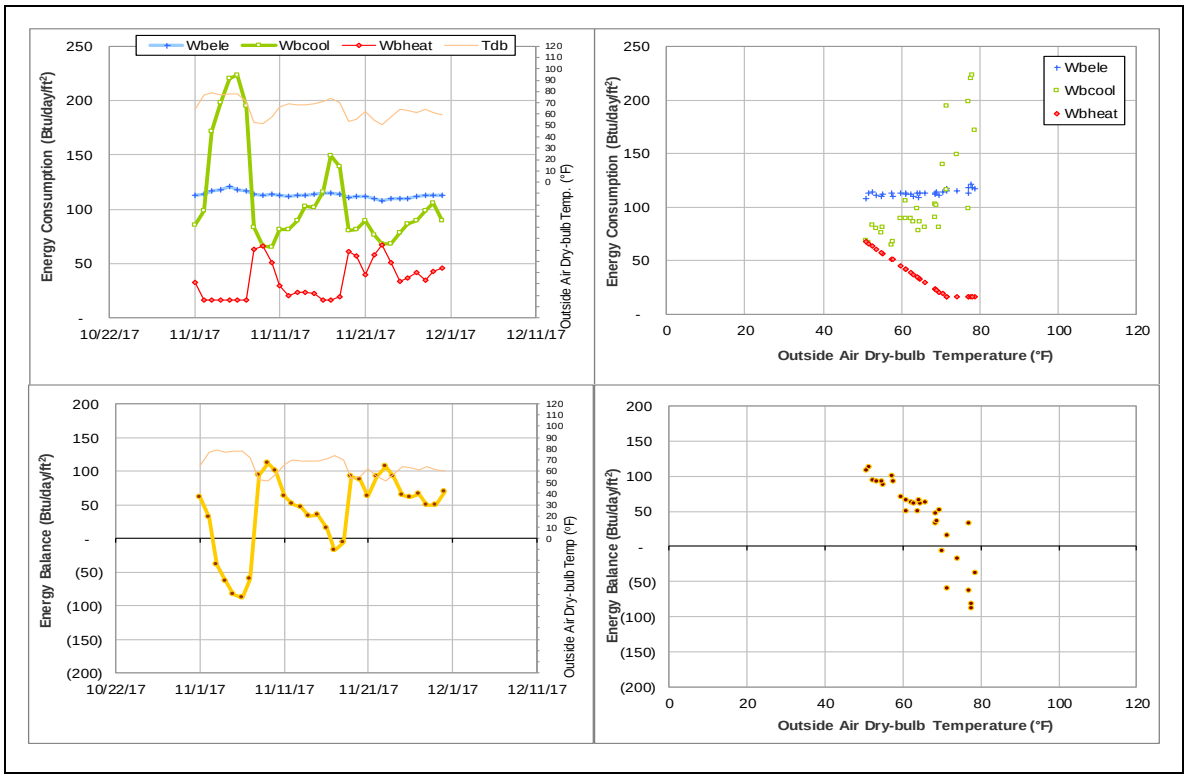
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office. (HHW during November 2017)



Energy balance plot using the original data for the month of analysis. Missing data have been filled in, if any.



Energy balance plot using the estimated data for the month of analysis.



George Bush Presidential Library & Museum (TAMU Bldg #1606)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
HHW	002812	30	11/1/2017 – 11/30/2017	Model

Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
HHW	The consumption level has increased suddenly.	6/8/2017 – Ongoing

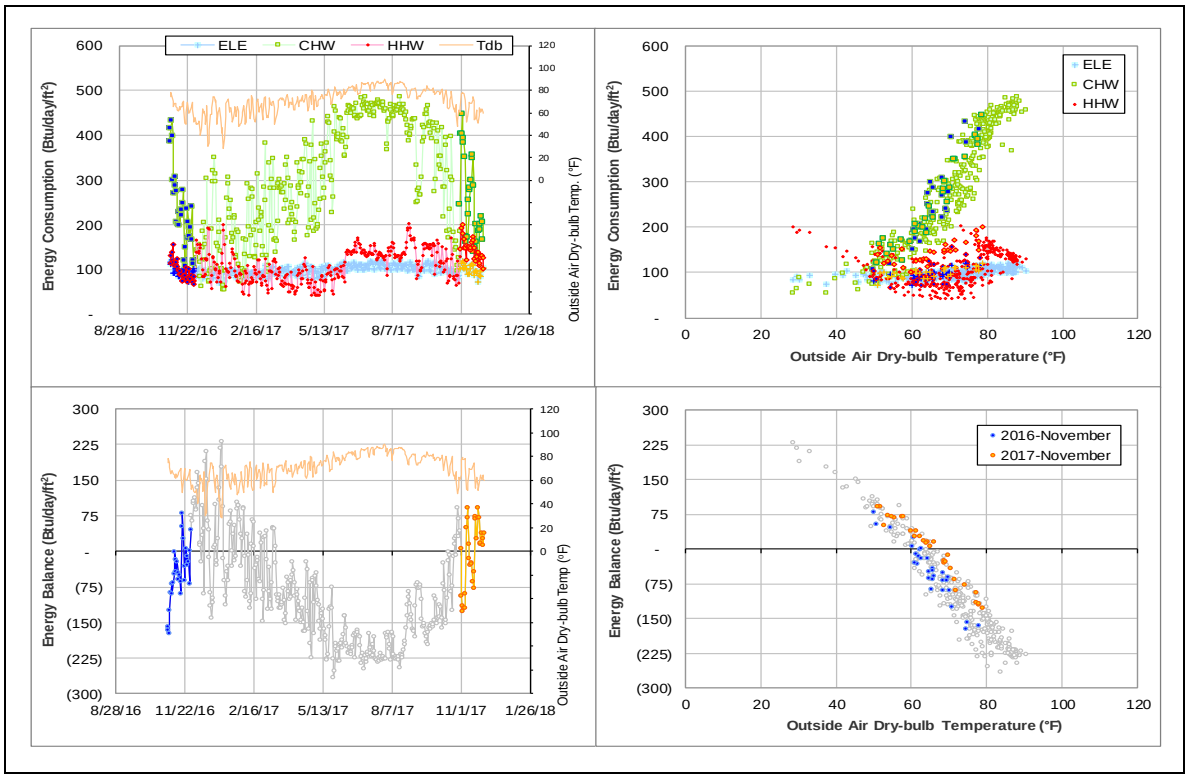
Changes in sensor readings related to the detected issues

Energy Type	Meter ID	Period	Type	Description
HHW	002812	6/8/2017 – Ongoing	Return temp	Low

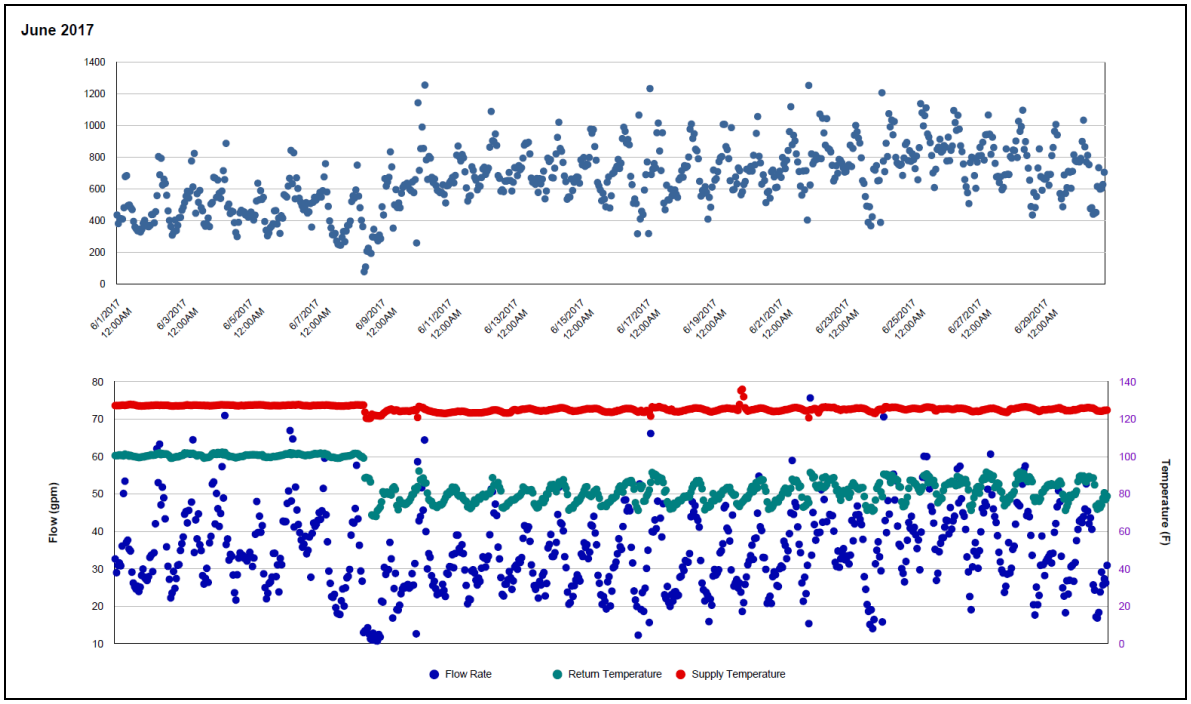
Quantitative descriptions and comments

Return temperature of HHW dropped from about 100°F to 80 – 100°F since 6/8/2017 resulting an increased Delta-T. As there is no significant change in flow rate, HHW consumption increased significantly. This month is estimated by model.

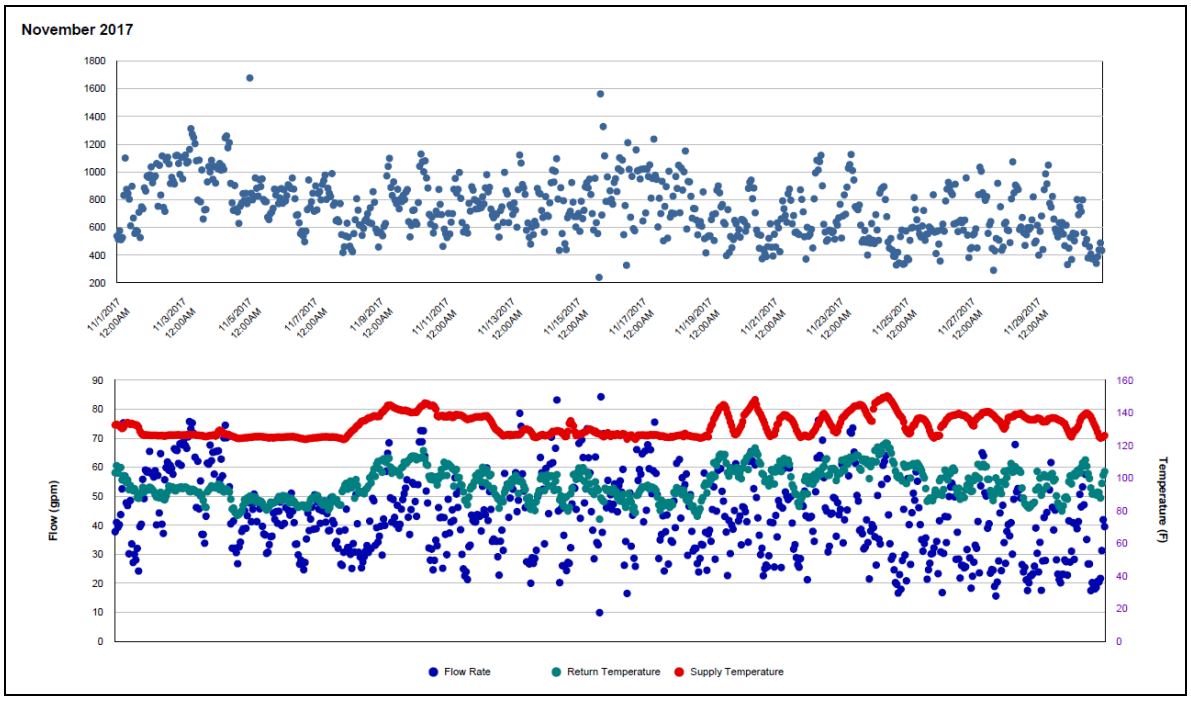
Explanatory Figure: 13 months energy balance plot with original data.



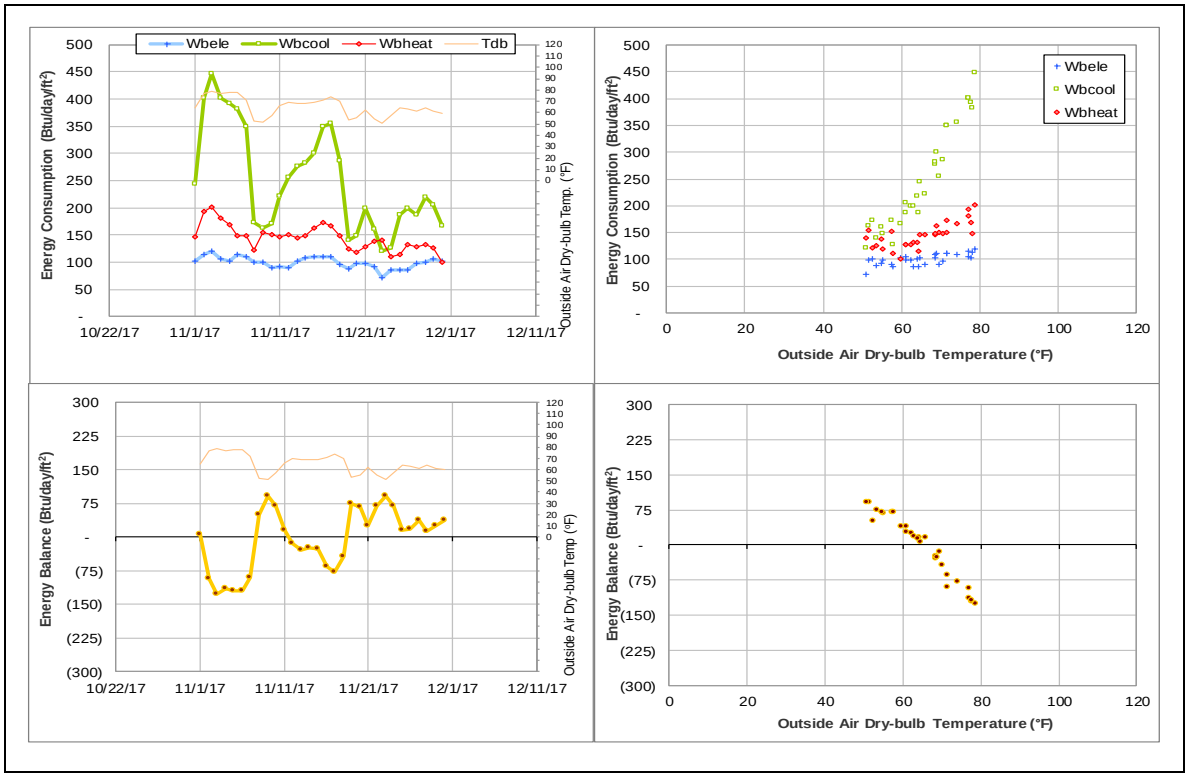
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office. (HHW during June 2017)



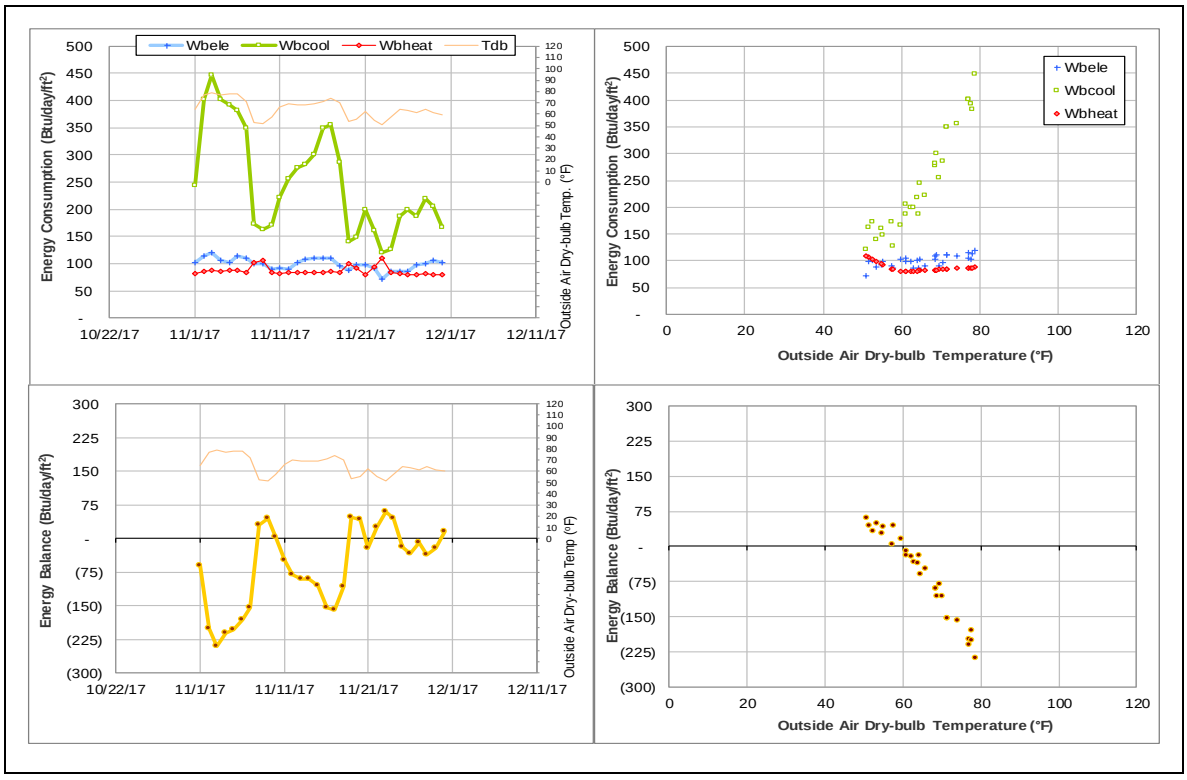
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office. (HHW during November 2017)



Energy balance plot using the original data for the month of analysis. Missing data have been filled in, if any.



Energy balance plot using the estimated data for the month of analysis.



New TVMDL (TAMU Bldg #1809)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
ELE	009652	30	11/1/2017 – 11/30/2017	Factor
ELE	009653	30	11/1/2017 – 11/30/2017	Factor

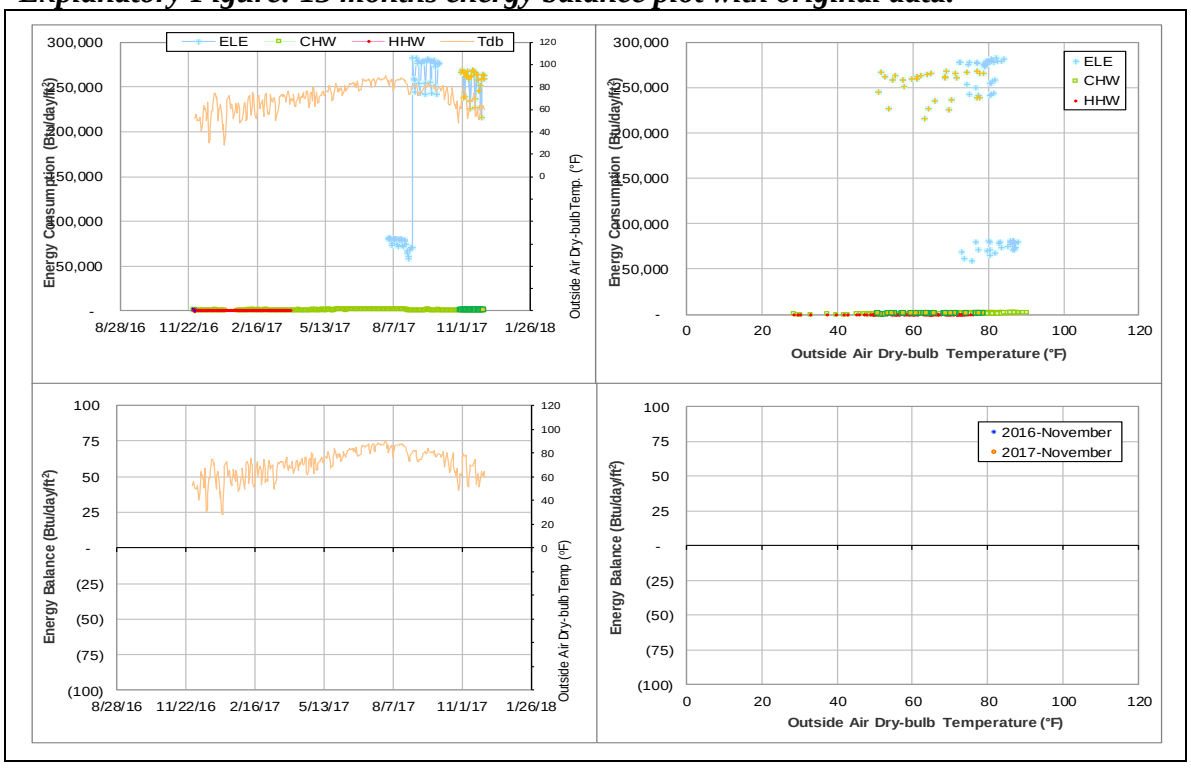
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
ELE	The metered values appear to be faulty.	8/1/2017 – Ongoing

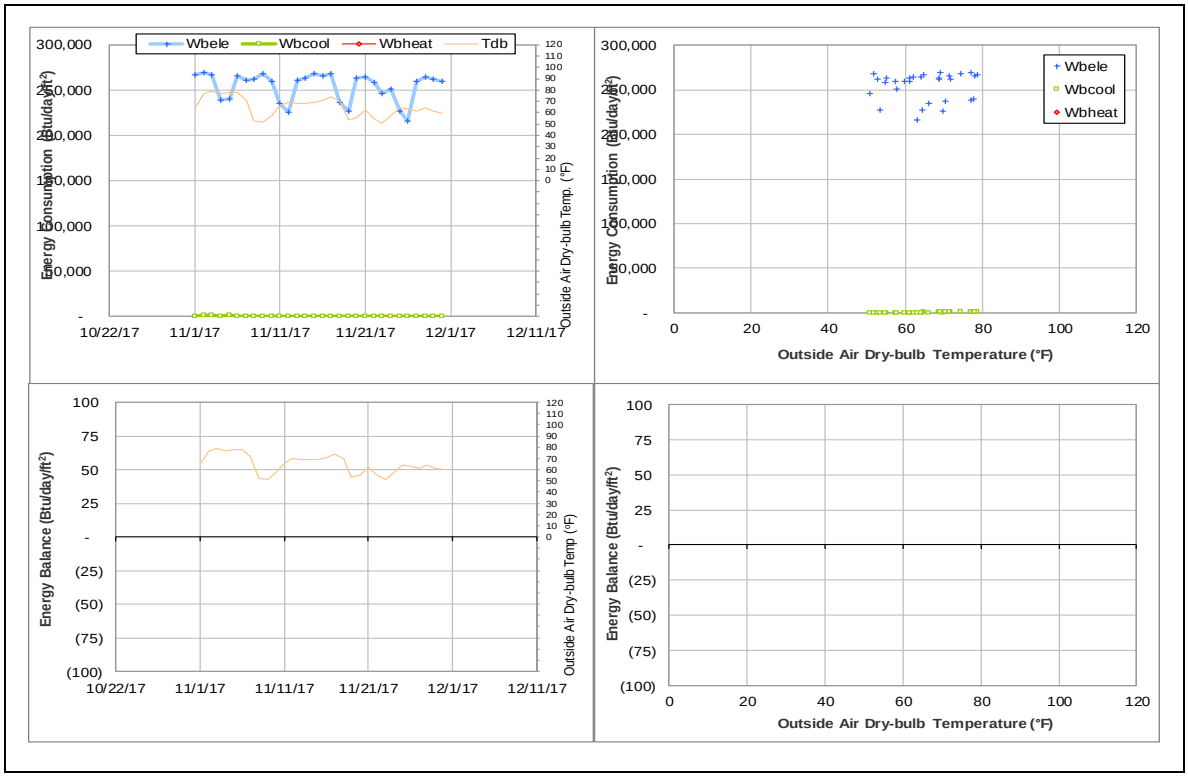
Quantitative descriptions and comments

The received ELE data have unnaturally large values. They would fall back to a reasonable level when divided by 1,000.

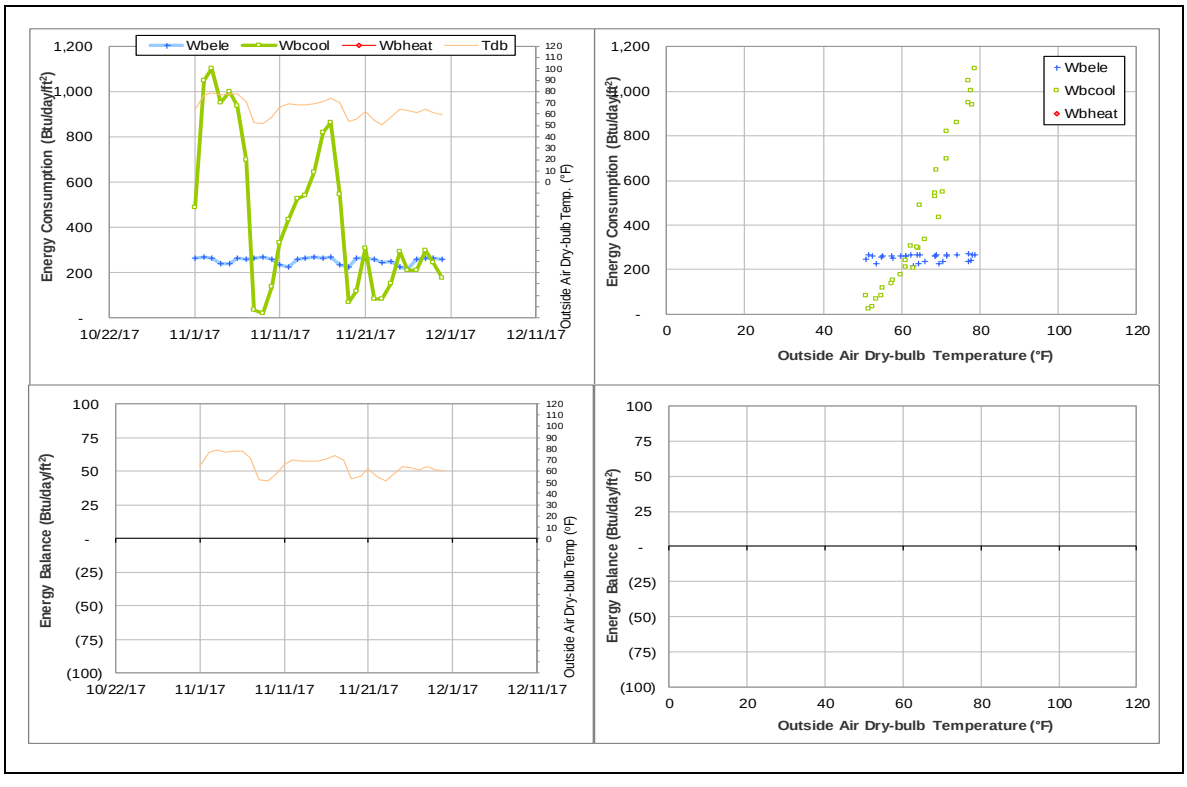
Explanatory Figure: 13 months energy balance plot with original data.



Energy balance plot using the original data for the month of analysis. Missing data have been filled in, if any.



Energy balance plot using the estimated data for the month of analysis.



Texas Institute for Genomic Medicine (TAMU Bldg #1900)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
HHW	005546	7	11/5/2017, 11/6/2017, 11/8/2017 – 11/12/2017	Model

Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
HHW	The consumption increased for a short period.	11/5/2017, 11/6/2017, 11/8/2017 – 11/12/2017

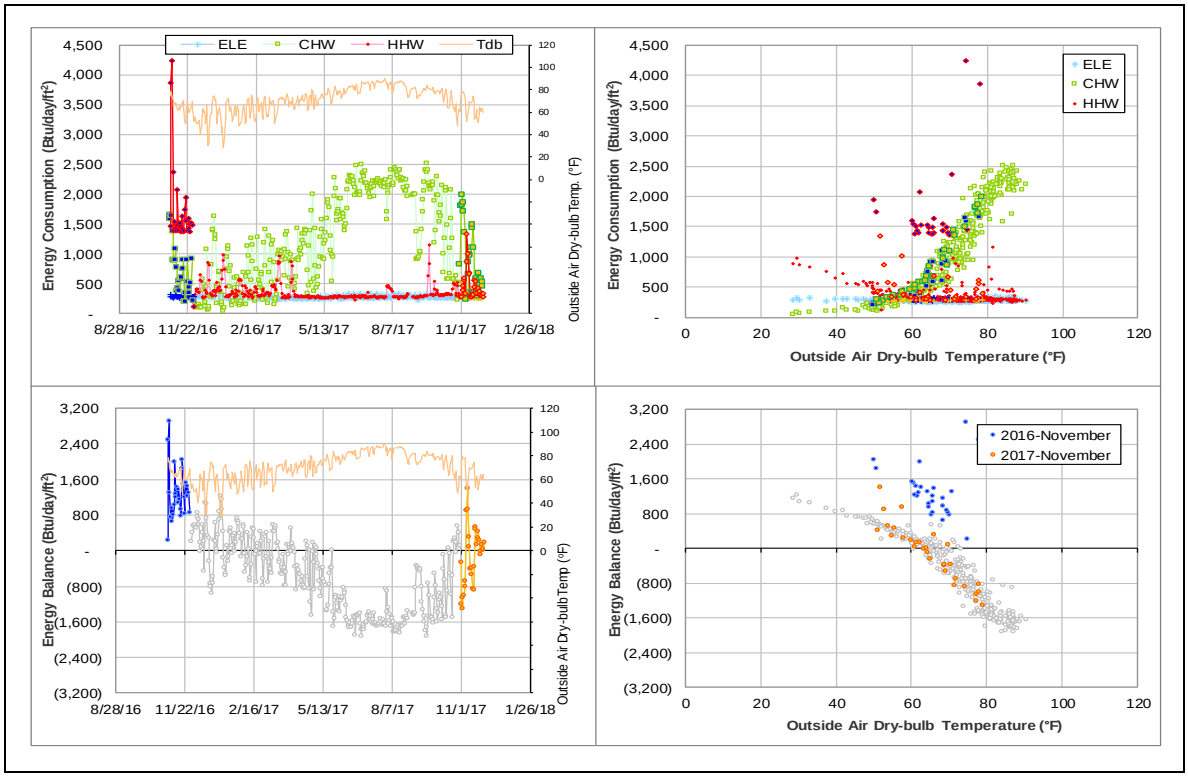
Changes in sensor readings related to the detected issues

Energy Type	Meter ID	Period	Type	Description
HHW	005546	11/5/2017, 11/6/2017, 11/8/2017 – 11/12/2017	Delta-T	High

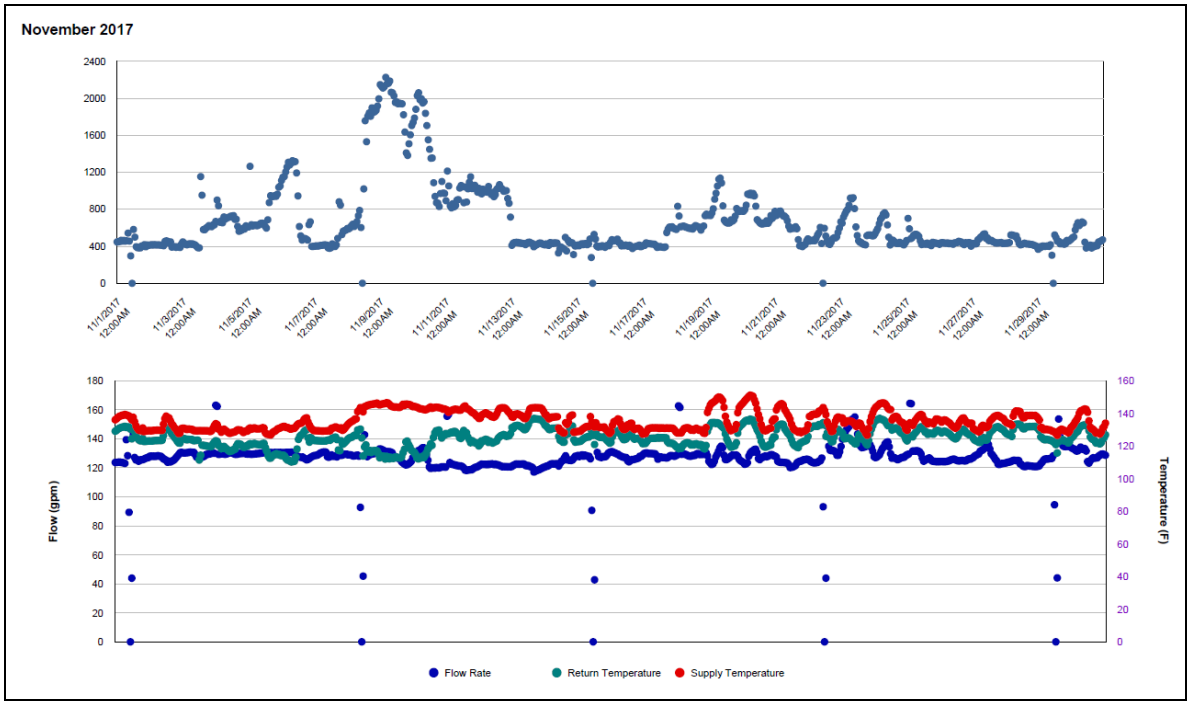
Quantitative descriptions and comments

Temperature difference of HHW MID 005546 had abnormally high values on 11/5/2017, 11/6/2017, and 11/8/2017 – 11/12/2017, resulting in several data points significantly higher than the main pattern. These days are estimated by model.

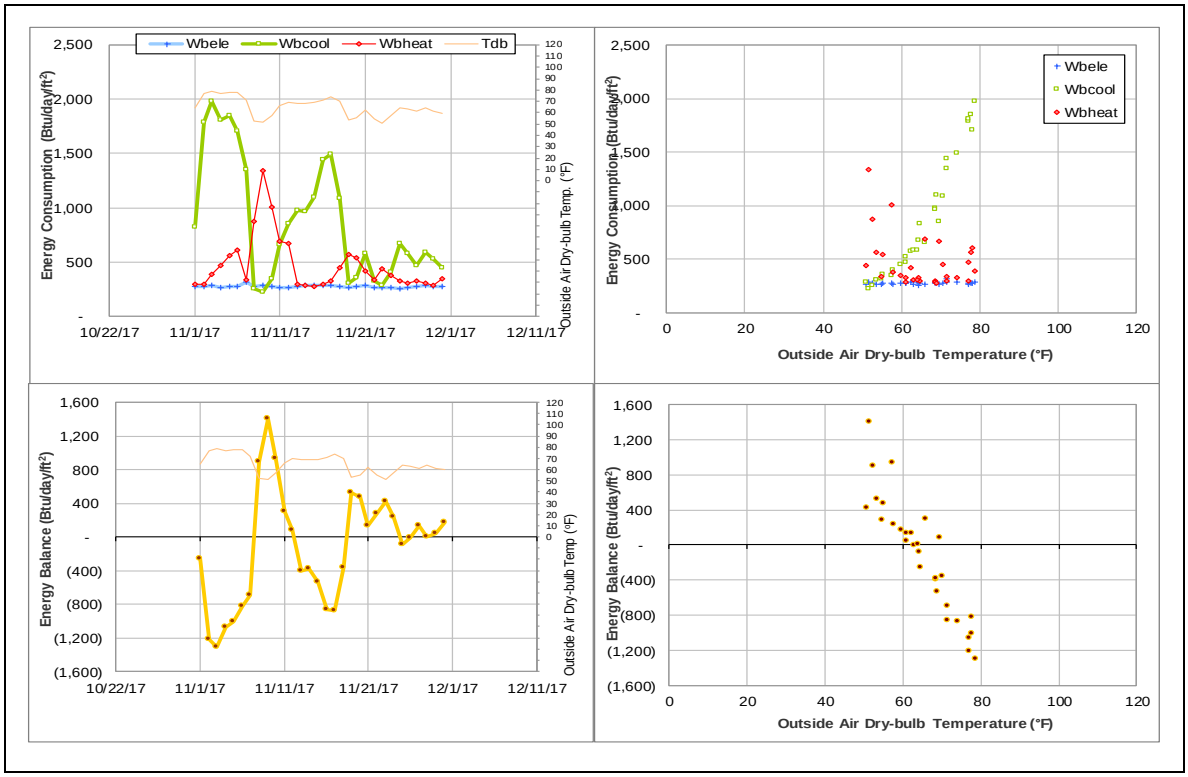
Explanatory Figure: 13 months energy balance plot with original data.



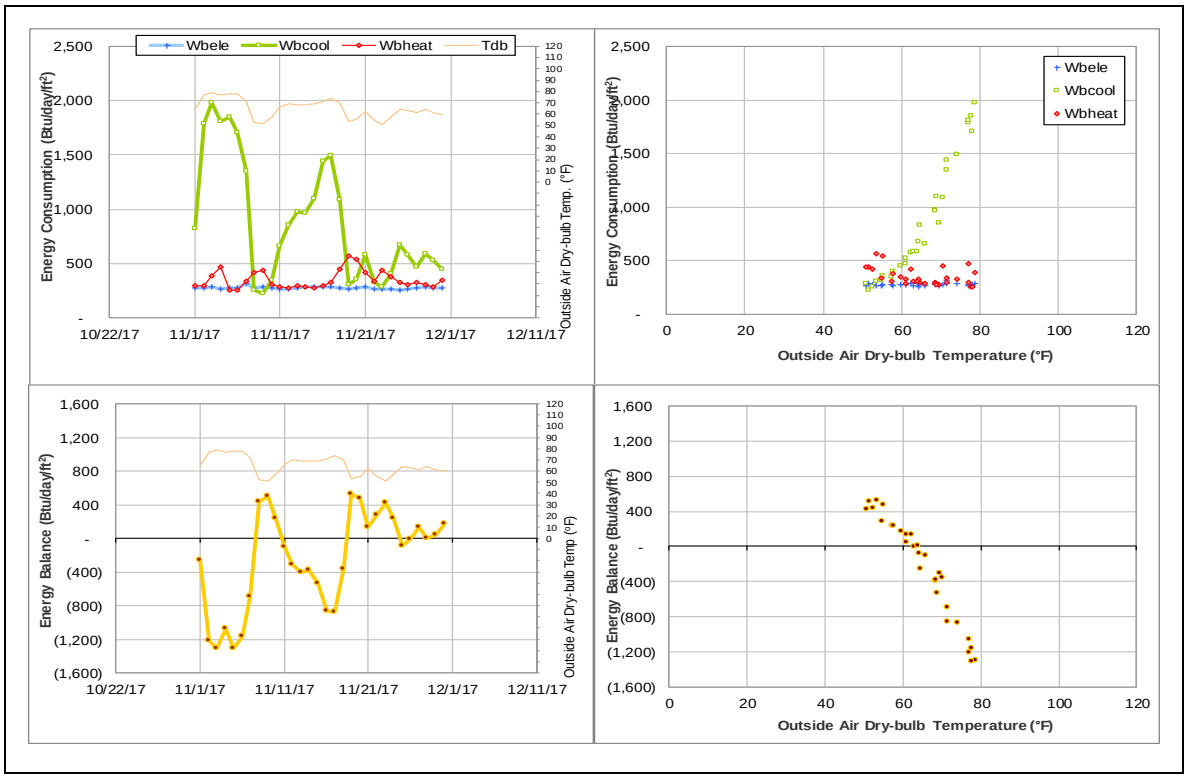
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office. (HHW during November 2017)



Energy balance plot using the original data for the month of analysis. Missing data have been filled in, if any.



Energy balance plot using the estimated data for the month of analysis.



Multi-Species Research Building (TAMU Bldg #1911)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
CHW	009129	30	11/1/2017 – 11/30/2017	Model
HHW	009133	30	11/1/2017 – 11/30/2017	Model

Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
CHW	The consumption level is increasing gradually. The consumption level is higher than the level during the past year.	10/25/2017 – Ongoing
HHW	The consumption level has increased suddenly.	7/13/2017 – Ongoing

Changes in sensor readings related to the detected issues

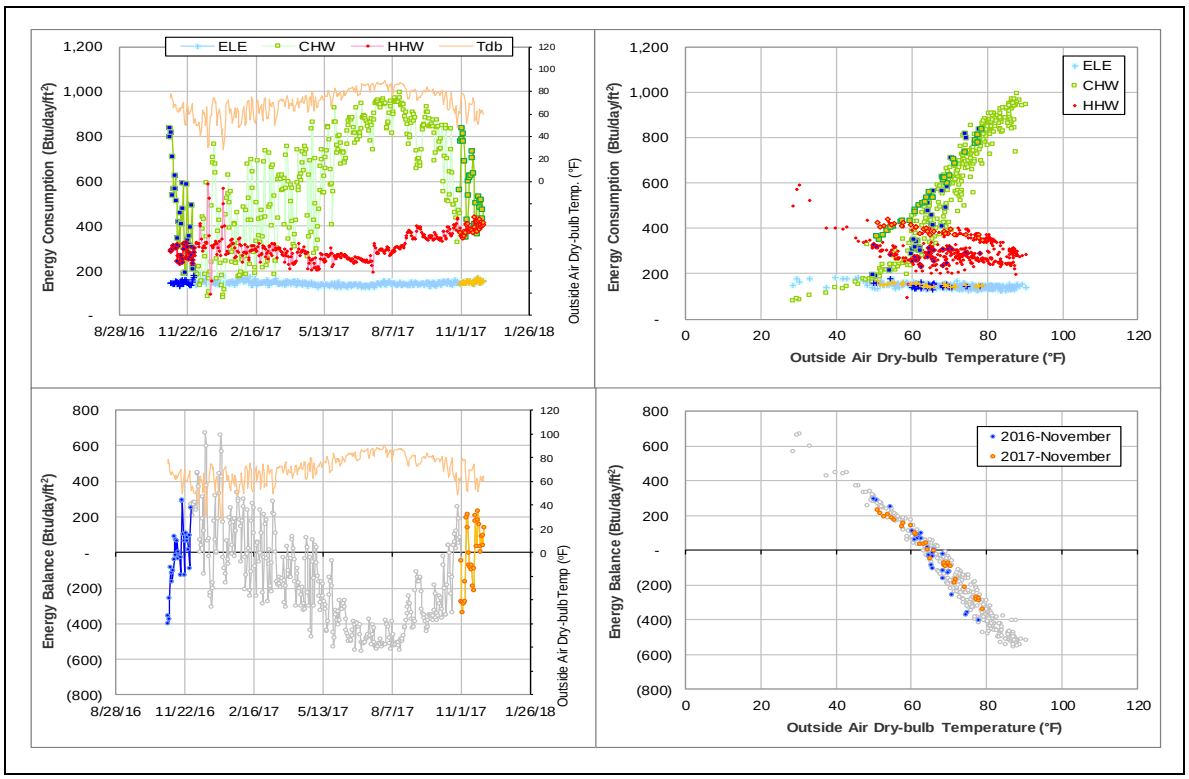
Energy Type	Meter ID	Period	Type	Description
HHW	009133	7/13/2017 – Ongoing	Return temp	Low

Quantitative descriptions and comments

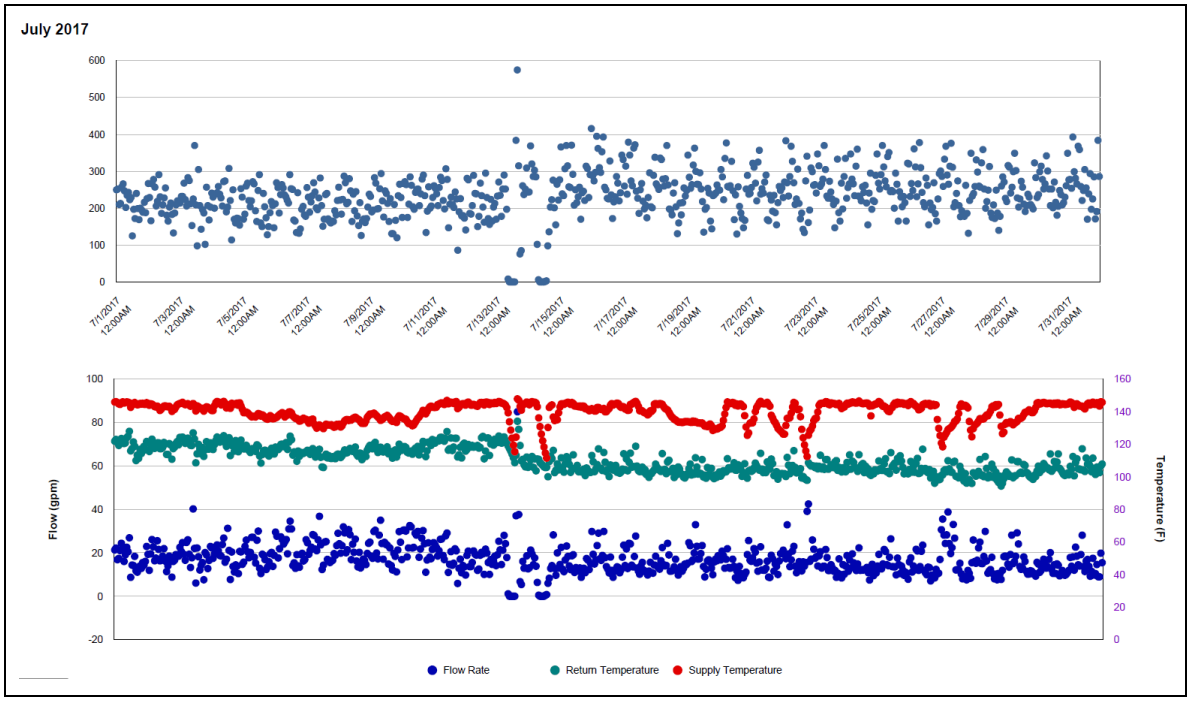
CHW consumption of this building started to increase in the end of October 2017 and went off the main pattern at the low-temperature side. There is no obvious meter fault observed associated with this change. This month is estimated by model.

Return temperature of HHW decreased on 7/13/2017, resulting in a larger Delta-T and hence higher HHW consumption. The consumption is going further up in August 2017. This month is estimated by model.

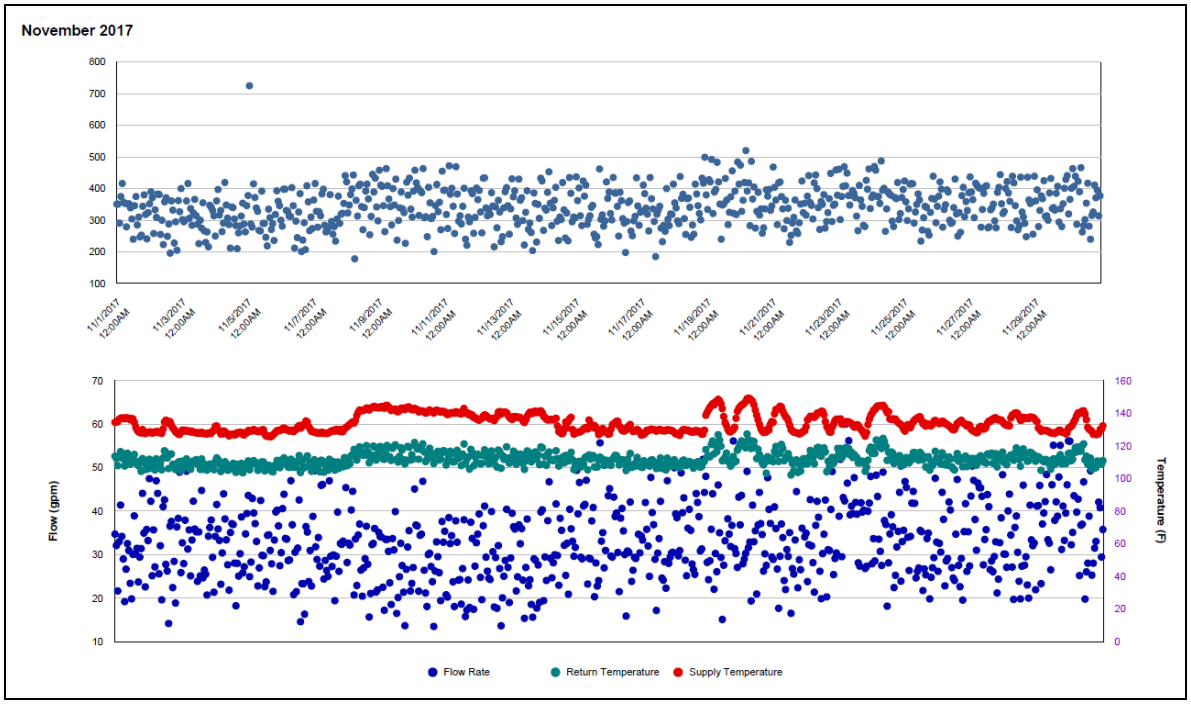
Explanatory Figure: 13 months energy balance plot with original data.



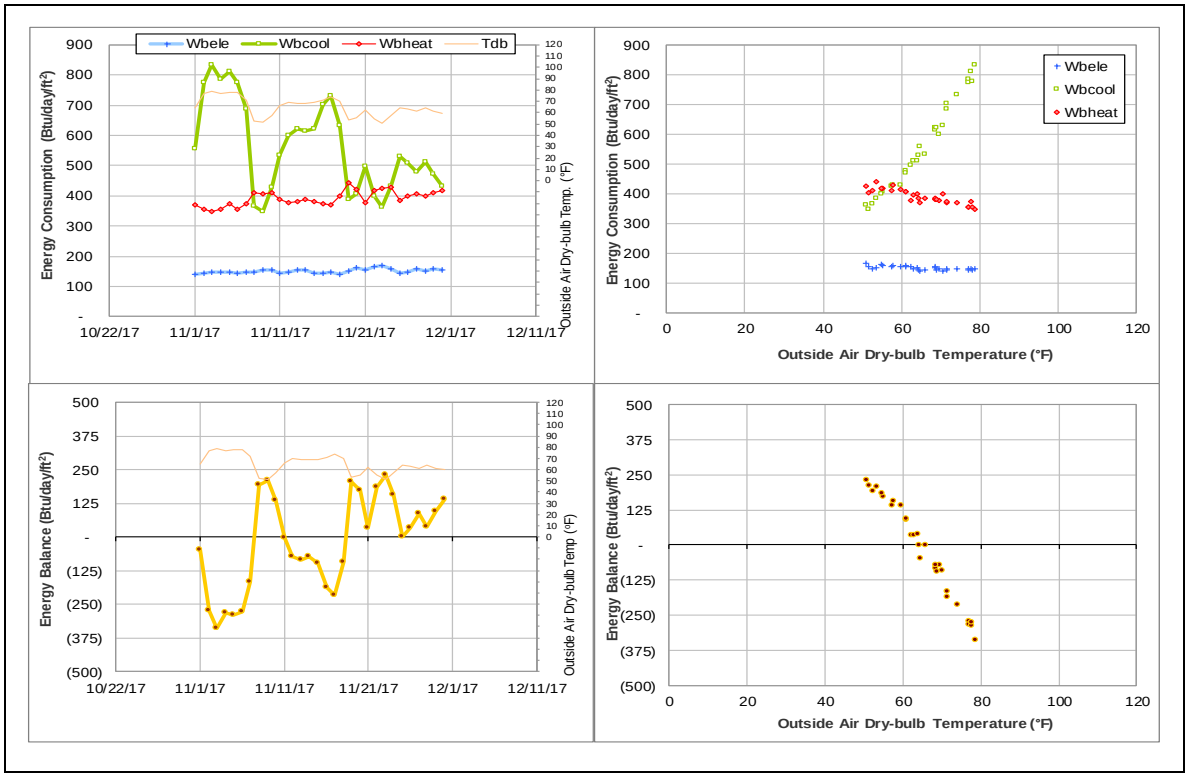
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office. (HHW during July 2017)



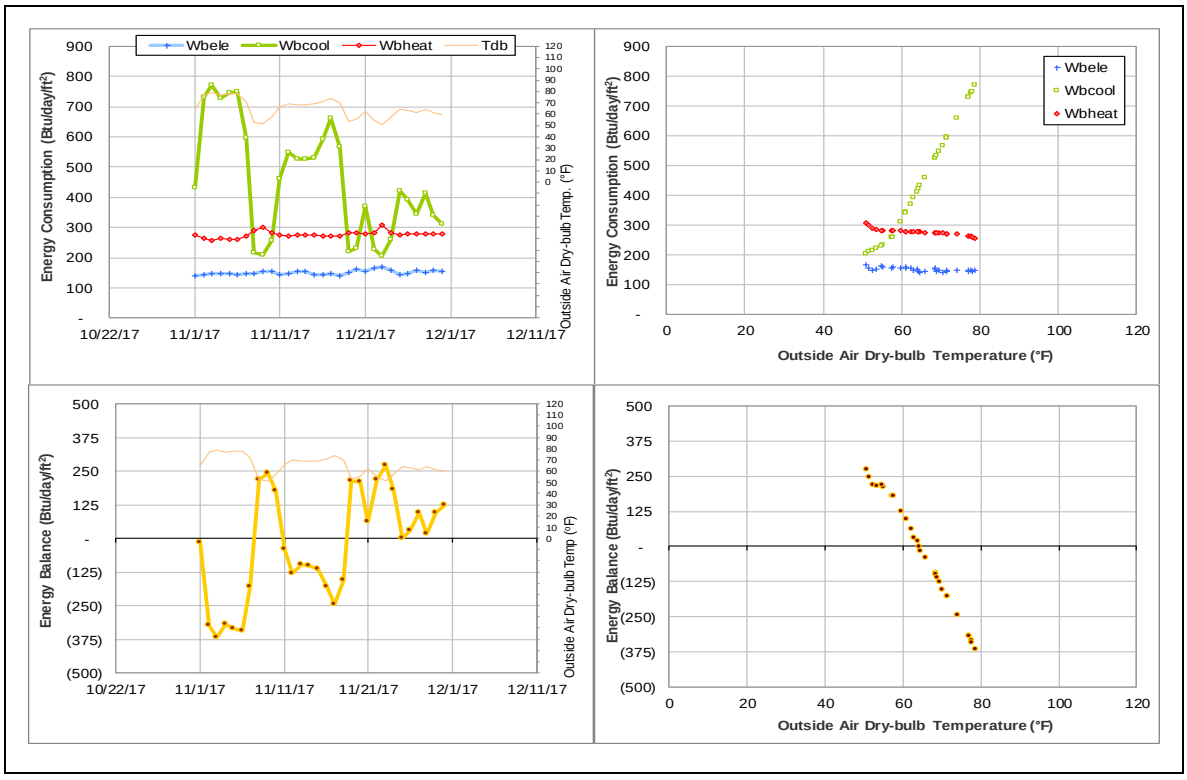
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office. (HHW during November 2017)



Energy balance plot using the original data for the month of analysis. Missing data have been filled in, if any.



Energy balance plot using the estimated data for the month of analysis.



I-3 Meters with Significant Issues in Energy Consumption Data

In this section, significant issues in the data behavior are described. On the contrary to the section II–2, alternative consumption is not estimated for some reasons: presence of continuous problems since the beginning of the data acquisition, unbalanced energy uses in the past data, changes in the consumption patterns without evidence of data problems, etc. Table II–3 gives a list of meters included in this section.

Table II-3 Meters with significant issues in the consumption data during November 2017

Building No.	Building Name	MeterID	Type
0291	Rudder Residence Hall		
		002132	CHW
		002136	HHW
0293	Appelt Residence Hall		
		002062	CHW
		002066	HHW
0325 & 0385	CE TTI Office & Lab Building		
		009123	CHW
0353	Bright Aerospace Building		
		002746	CHW
0394	Underwood Residence Hall		
		002117	CHW
		002121	HHW
0398	Langford Architecture Center Building A		
		003951	CHW
		003955	HHW
0419	Legett Residence Hall		
		000031	ELE
		002218	CHW
		002222	HHW
426-427-428	FHK Complex		
		002848	CHW
440	Commons Hall		
		009237	CHW
433	Mosher Residence Hall		
		002485	CHW
		002489	HHW
442	Dunn Residence Hall		
		009095	ELE
443	Oceanography & Meteorology Building		
		006392	HHW
463	Psychology Building		
		002941	CHW
464	State Chemist Building		
		005839	ELE
		005837	ELE
484	Chemistry Building		
		007557	ELE
		007152	ELE
0496	Utilities & Energy Services Central Office		
		007706	ELE
		006929	CHW
		006933	HHW
0506	Nagle Hall		
		001484	ELE
		003619	CHW
		003623	HHW
0511	Heep Laboratory Building		
		005787	ELE
		005821	CHW
		005825	HHW
0512	All Faiths Chapel		
		004293	HHW
0514	Munnerlyn Astronomy & Space Sciences Engineering		
		007487	CHW
0516	Computing Services Center		
		003959	CHW
0520	Beutel Health Center		
		003944	HHW
0524	Blocker building		
		002914	CHW
		002918	HHW
0652	Neeley Residence Hall		
		002151	HHW
0740	McNew Laboratory		
		005874	ELE
		005974	CHW
		005968	HHW
1041	Texas Vet Med Diagnostic Lab		
		001466	ELE
		001539	ELE
		003817	CHW
		004137	CHW
		003821	HHW
		004130	HHW
1156	Physical Plant Administration & Shops		
		007679	CHW
1508	Price Hobgood Ag. Engineering Research Lab		
		006005	CHW
		006009	HHW
1509	Medical Sciences Library		
		000350	ELE
		003777	CHW
		003781	HHW
1558	Cox-McFerrin Center for Aggie Basketball		
		007577	HHW
1601	International Ocean Discovery Building		
		006351	ELE
		006382	CHW
		008144	CHW
		008145	HHW
		009829	HHW
1604	Offshore Technology Research Center		
		006660	ELE
1904	Texas A&M Institute for Preclinical Studies A		
		006364	ELE
		006365	CHW
		006366	HHW

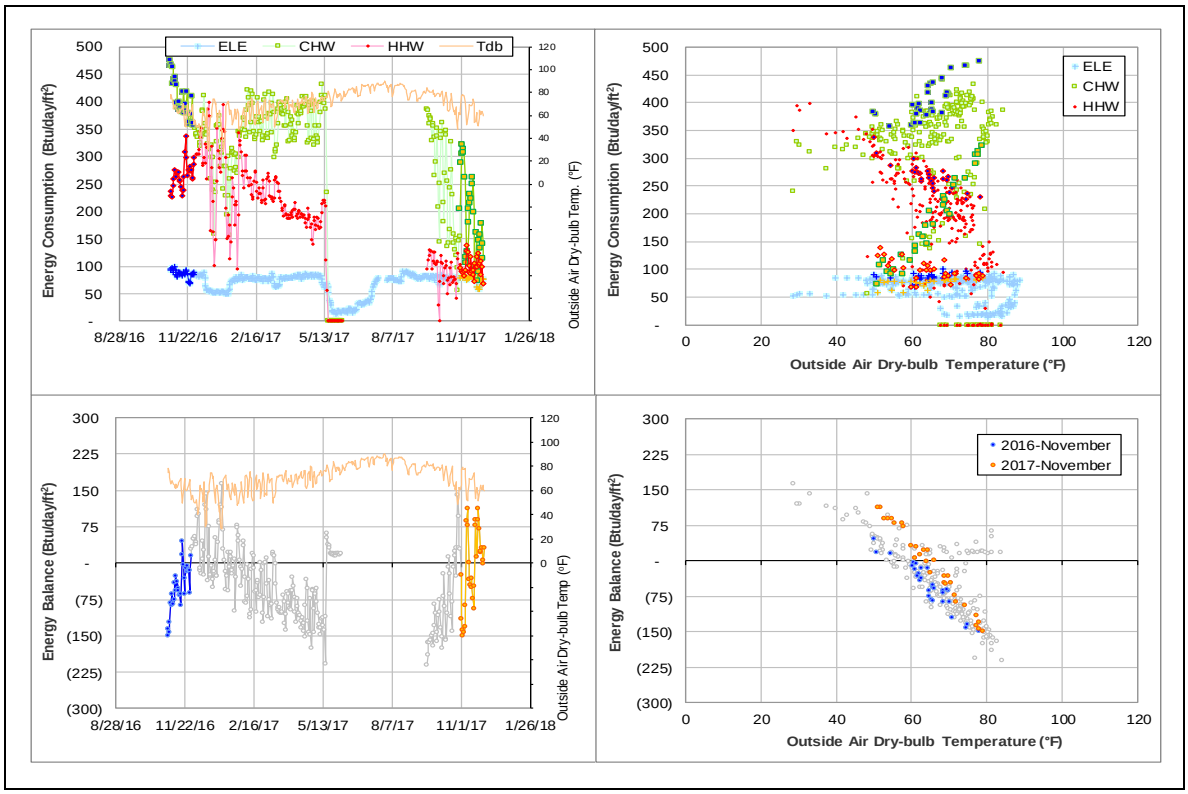
Rudder Residence Hall (TAMU Bldg #291)

Comments

This building had renovation in summer of 2017. Both the CHW and HHW data was missing for several months. The data became available on 9/19/2017 with lower consumption level compared to the level before renovation as excepted.

The cross-point temperature of energy balance for this building was around 58°F before renovation and it increased slightly now. More data is needed to see how the pattern develops.

Explanatory Figure: 13 months energy balance plot with original data



Appelt Residence Hall (TAMU Bldg #293)

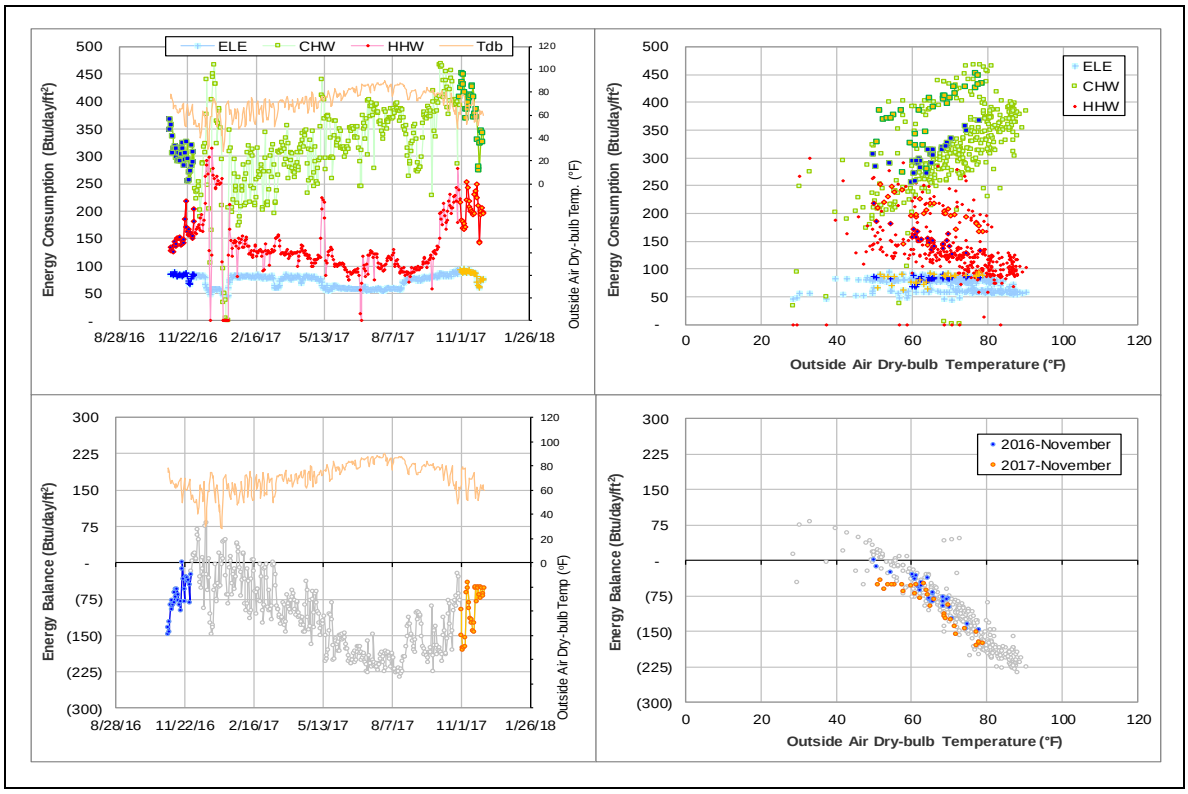
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
Energy Balance	The energy balance decreased and the cross-point temperature is around 55°F.	Since January 2015

Comments

Both the CHW and HHW consumption levels have been unstable and changing frequently. The energy balance load was low with the cross-point temperature around 55°F for years. The low E_{BL} level suggests an imbalance of metered energy use in the building, but we are not able to determine the cause.

Explanatory Figure: 13 months energy balance plot with original data



CE TTI Office & Lab Building (TAMU Bldg #325-385)

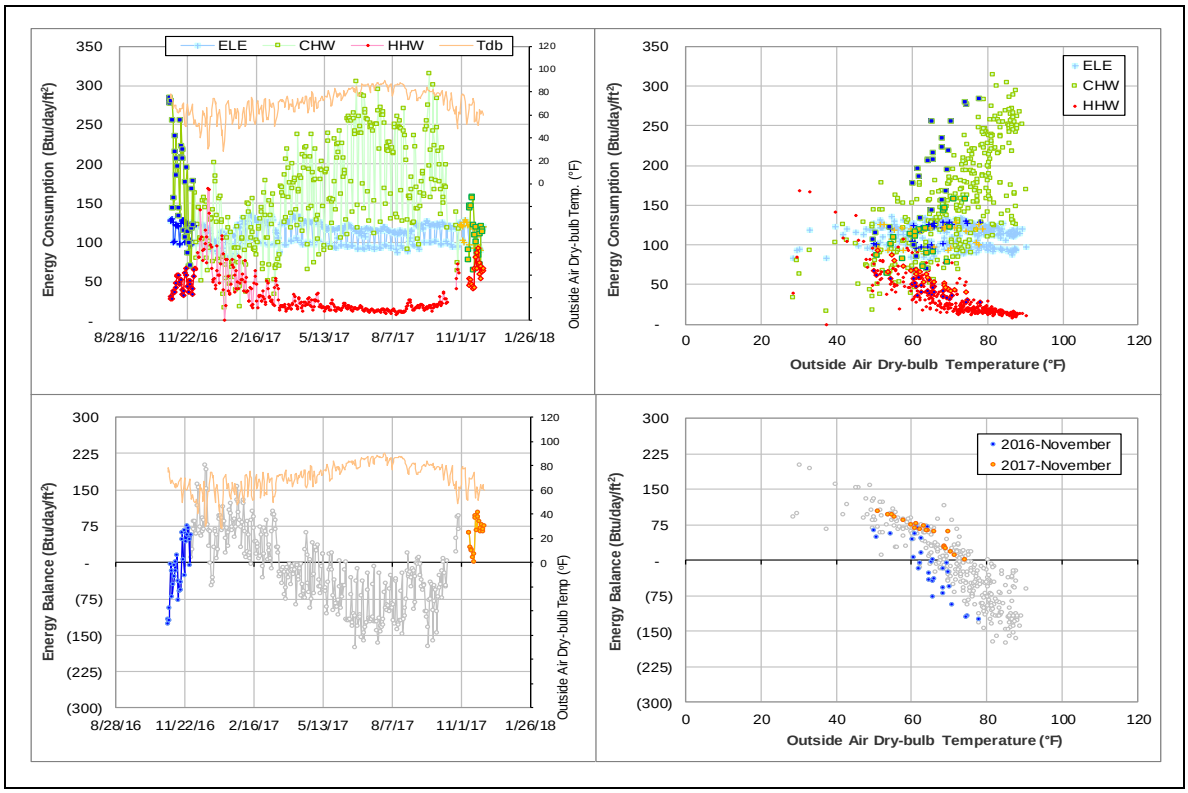
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
CHW	The consumption level decreased.	Since July 2016

Comments

CHW consumption gradually dropped to a level that is lower than the past year by 50 – 100 Btu/day/ft^2 since July 2016. No obvious sensor reading behavior anomaly is observed. More data is needed to see how the pattern develops.

Explanatory Figure: 13 months energy balance plot with original data.



Bright Building (TAMU Bldg #353)

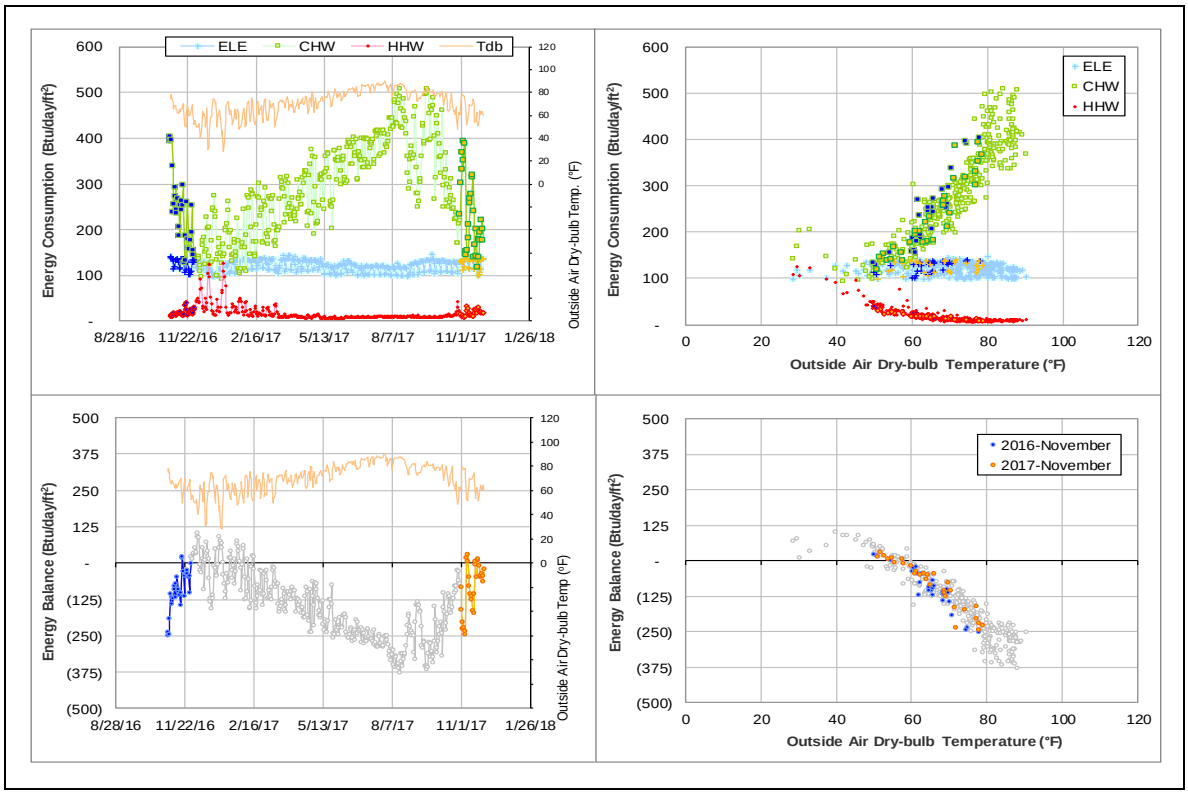
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
Energy Balance	The energy balance level has been low for years. The cross-point temperature was in the range of 40 - 70 °F.	For several years
CHW	The consumption pattern changed.	Since July 2016

Comments

The energy balance load (E_{BL}) of this building has varied but always been low (the cross-point temperature was between 40°F and 70°F) for years. CHW consumption increased greatly on 7/21/2016 and switched to a new pattern with a steeper slope. The cross-point temperature is around 55°F which has been stable for one year but it is still a little low.

Explanatory Figure: 13 months energy balance plot with original data



Underwood Residence Hall (TAMU Bldg #394)

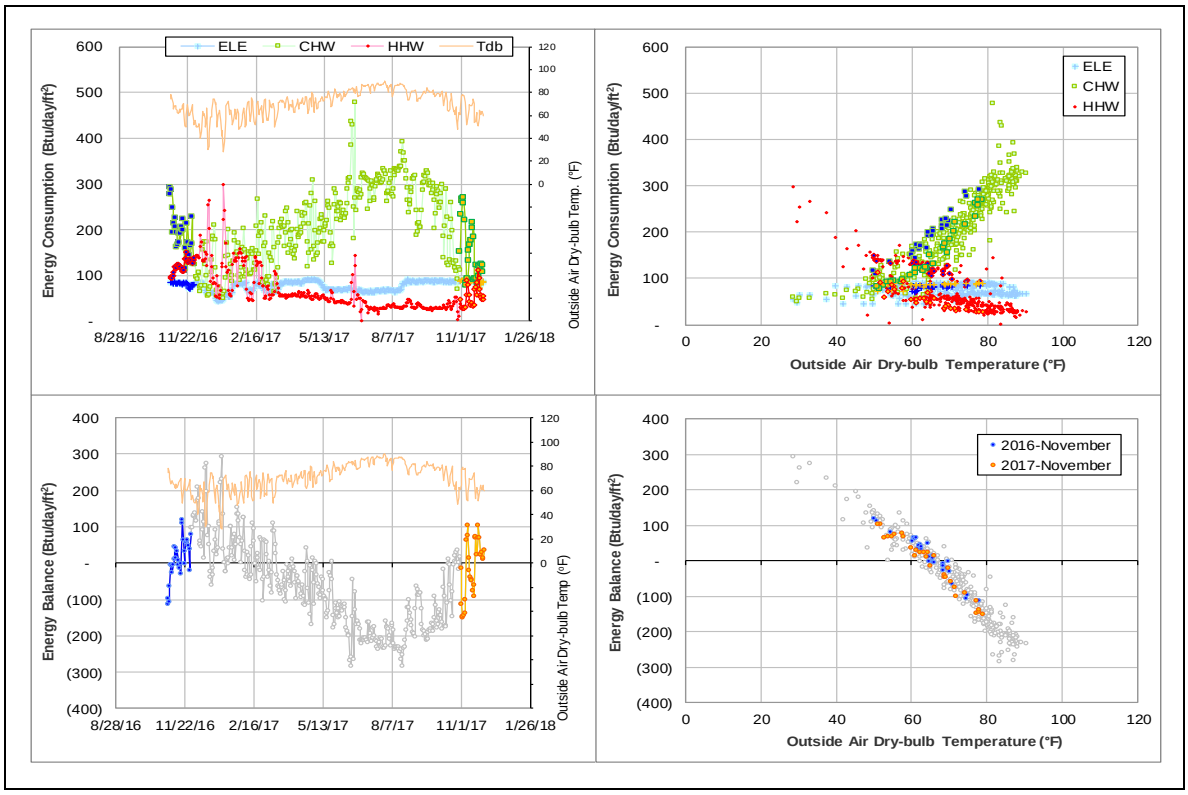
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
CHW	The consumption pattern is unstable.	9/1/2016 - ongoing
HHW	The consumption pattern is unstable.	9/1/2016 - ongoing

Comments

The CHW and HHW consumption has decreased since the data return in September 2016. There seem to be two different patterns forming, especially for HHW. More data is needed to see how the pattern develops.

Explanatory Figure: 13 months energy balance plot with original data.



Langford Architecture Center Building A (TAMU BLDG #398)

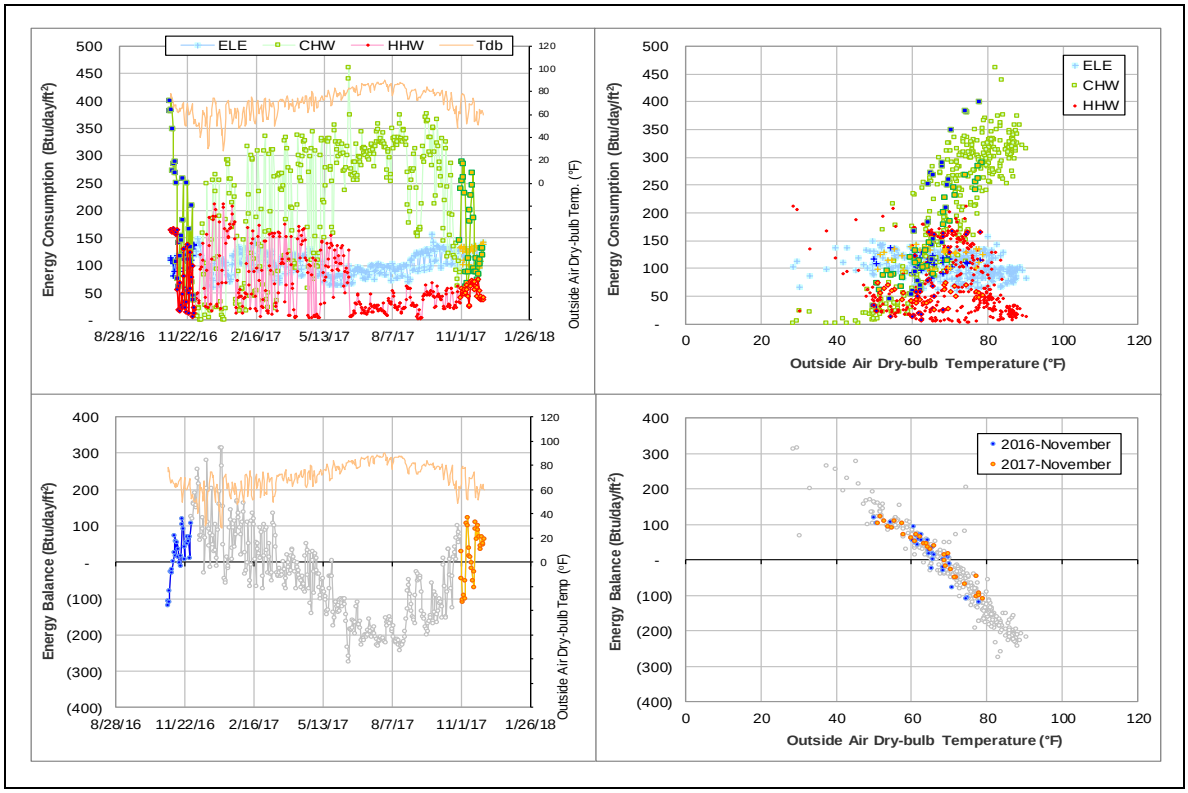
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
CHW and HHW	The consumption has been fluctuating greatly.	For several years

Comments

CHW and HHW consumption has been unstable for several years. HHW flow rate can be seen going up and down between a maximum level and a very low level. The energy balance, however, is not disturbed during these fluctuations.

Explanatory Figure: 13 months energy balance plot with original data



Legett Residence Hall (TAMU BLDG #419)

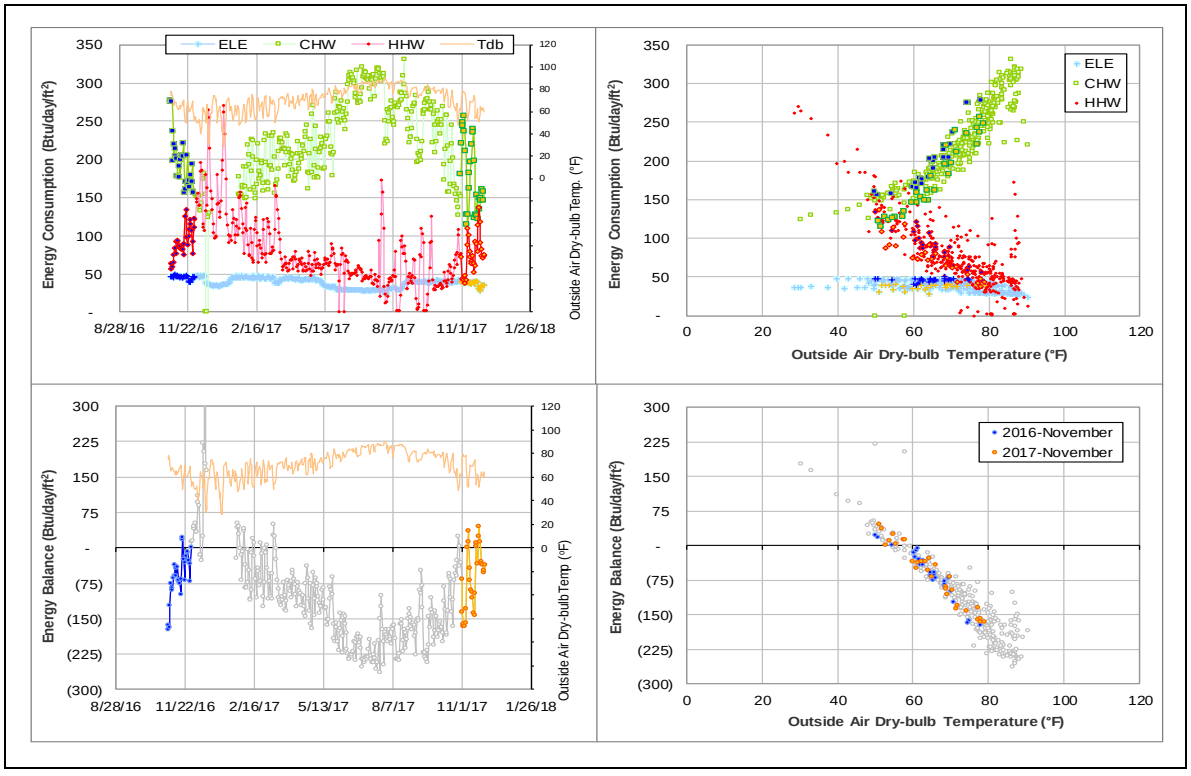
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
ELE	The consumption decreased after the missing period.	Since October 2016
HHW	The consumption slightly decreased after the missing period.	Since October 2016
CHW	The consumption increased after the missing period.	Since October 2016
EB	The cross-point moved from 68°F to 55°F.	Since October 2016
CHW and HHW	The consumption decreased slightly.	Since November 2017

Comments

After the missing period from May to October 2016, ELE and HHW consumption decreased and CHW consumption increased. EB cross-point moved from 68°F to 55°F since then. Both CHW and HHW consumption level is slightly lower than main pattern of last year. This change didn't affect energy balance, but it doesn't seem to be meter issue.

Explanatory Figure: 13 months energy balance plot with original data (The plot is rescaled to remove the spikes.)



FHK Complex (TAMU Bldg #426-427-428)

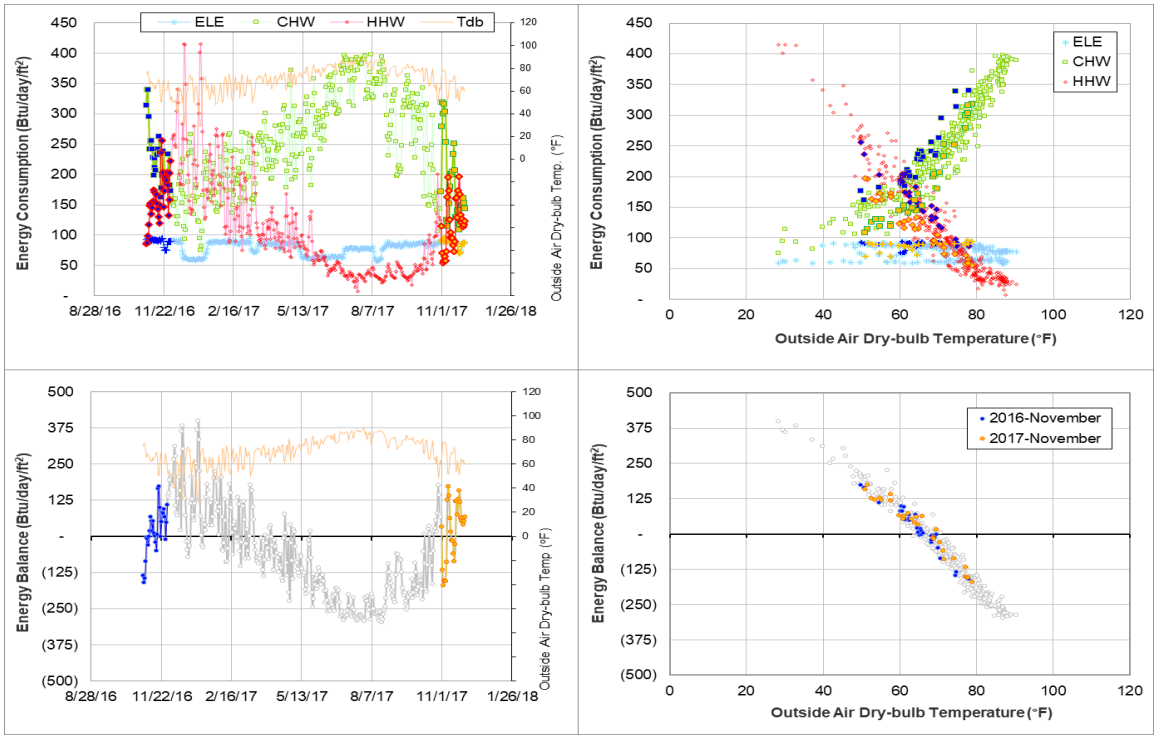
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
CHW/HHW	The consumption pattern has changed.	September 2017 – Ongoing

Comments

The CHW and HHW consumption pattern has changed starting September 2017. The most notable changes is seen at cooler temperatures with CHW decreasing up to 55 Btu/day/ft^2 and HHW decreasing up to 65 Btu/day/ft^2. The energy balance shows no change and maintains a change-point temperature around 68 °F. This does not appear to be a meter issue.

Explanatory Figure: 13 months energy balance plot with original data.



Mosher Residence Hall (TAMU Bldg #433)

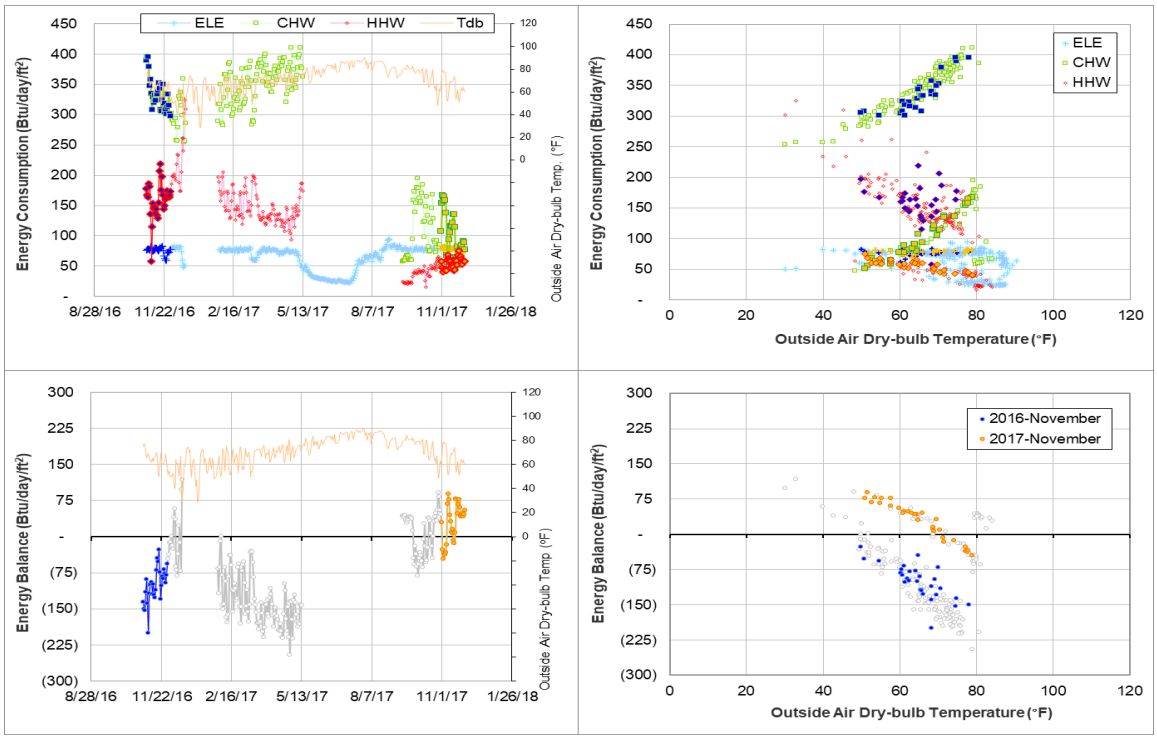
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
CHW/HHW	The consumption pattern has changed.	August 2017 – Ongoing

Comments

The Mosher Residence Hall underwent HVAC renovation during the summer of 2017. Upon completion of the new HVAC system, the CHW and HHW experienced a significant decrease in consumption. The CHW consumption decreased by 230 Btu/day/ft^2 (58%) in warmer temperatures and by 240 Btu/day/ft^2 (84%) in cooler temperatures. The HHW consumption decreased by 63 Btu/day/ft^2 (61%) in warmer temperatures and by 120 Btu/day/ft^2 (65%) in cooler temperatures. The energy balance change-point temperature increased from 51°F to 71°F.

Explanatory Figure: 13 months energy balance plot with original data.



Commons Hall (TAMU Bldg #440)

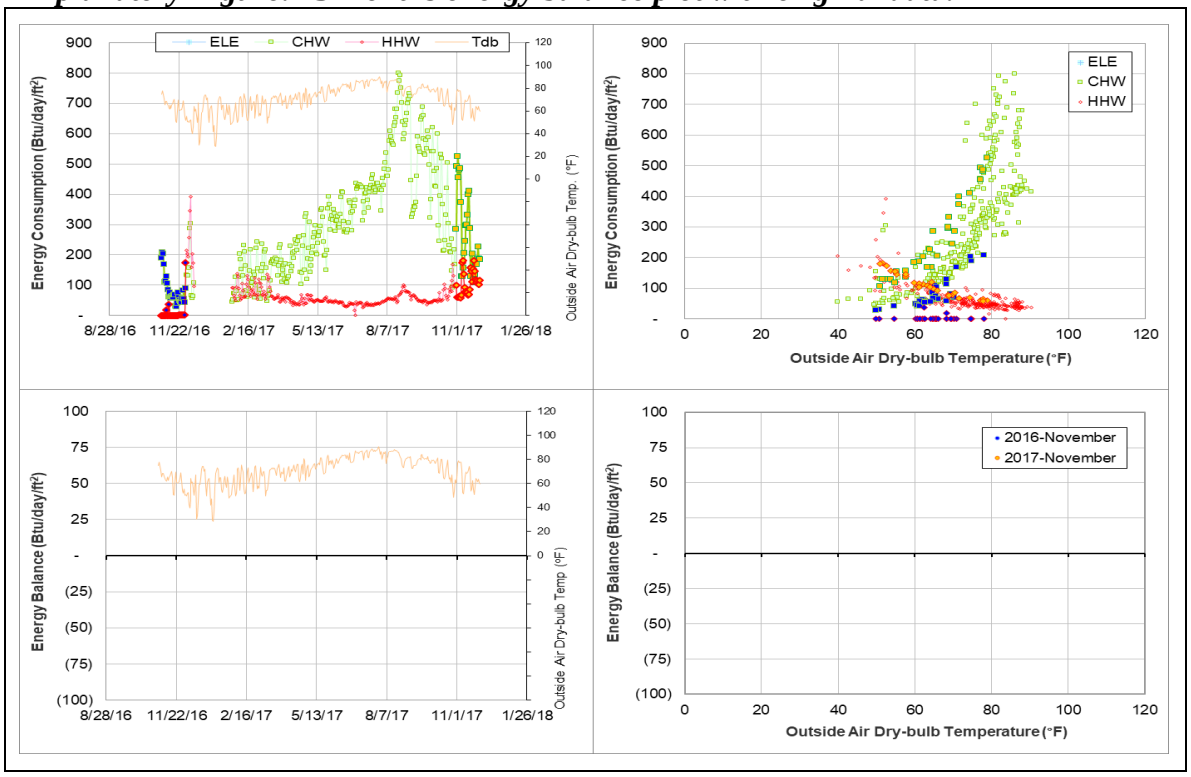
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
CHW	The consumption pattern has changed. The consumption level has increased suddenly.	August 2017 – Ongoing

Comments

Commons Hall recently underwent renovation in 2016. The study/activity area was completed by January 2017 and the dining facility was later completed in August 2017. The dining facility accounts for almost half the square footage of Commons Hall. The CHW consumption increased more notably in warmer temperatures by 120 – 200 Btu/day/ft^2 (25% – 33%) and by 80 Btu/day/ft^2 (53%) in the cooler temperatures.

Explanatory Figure: 13 months energy balance plot with original data.



Dunn Residence Hall (TAMU Bldg #442)

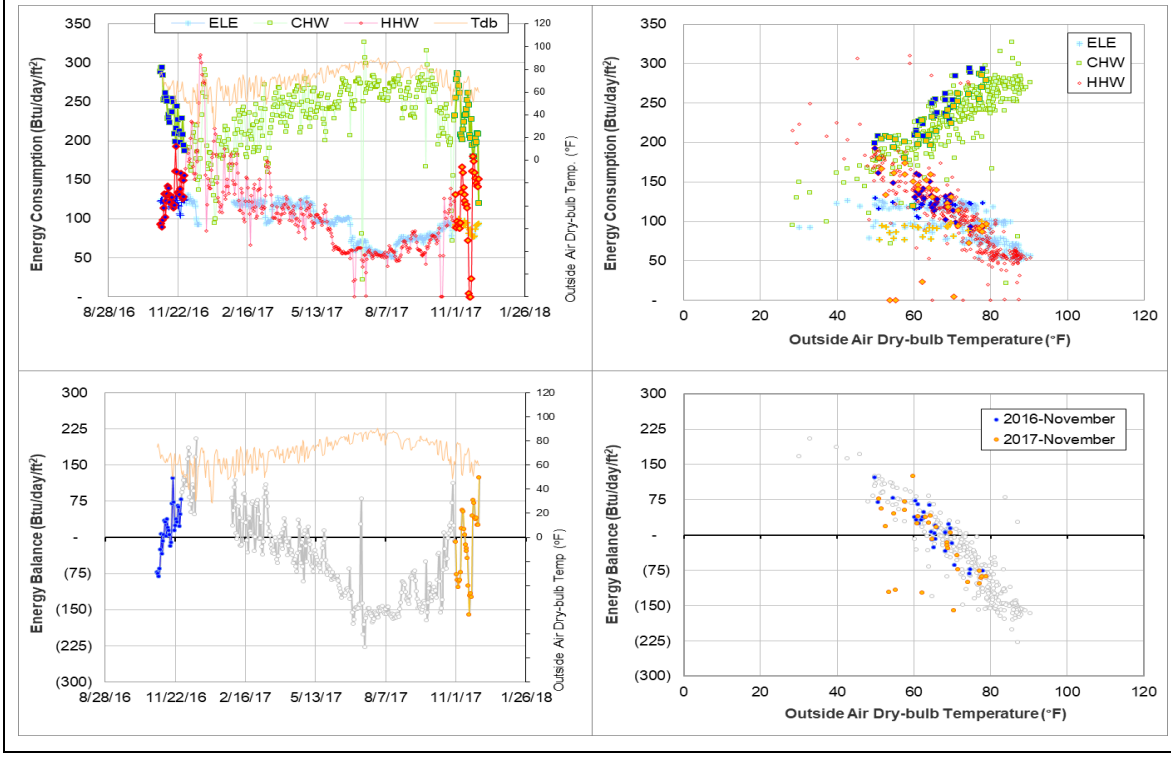
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
ELE	The consumption pattern has changed.	July 2017 – Ongoing

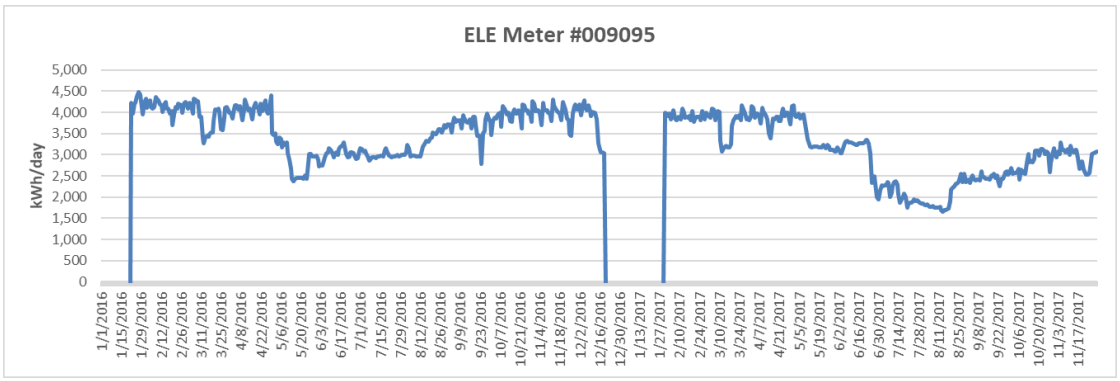
Comments

The consumption pattern for ELE changed starting around July 2017. The ELE pattern from July to mid-August was 30 Btu/day/ft^2 (34%) lower than last year. With the start of the semester, the ELE pattern only increased to a 75 Btu/day/ft^2 range, which is 37 Btu/day/ft^2 (33%) lower than last year. We would like to know if there has been any operational change for this building.

Explanatory Figure: 13 months energy balance plot with original data.



Explanatory Figure: Time series plot of ELE meter #009095 from 1/1/2016 – 11/30/2017.



Oceanography & Meteorology Building (TAMU Bldg #443)

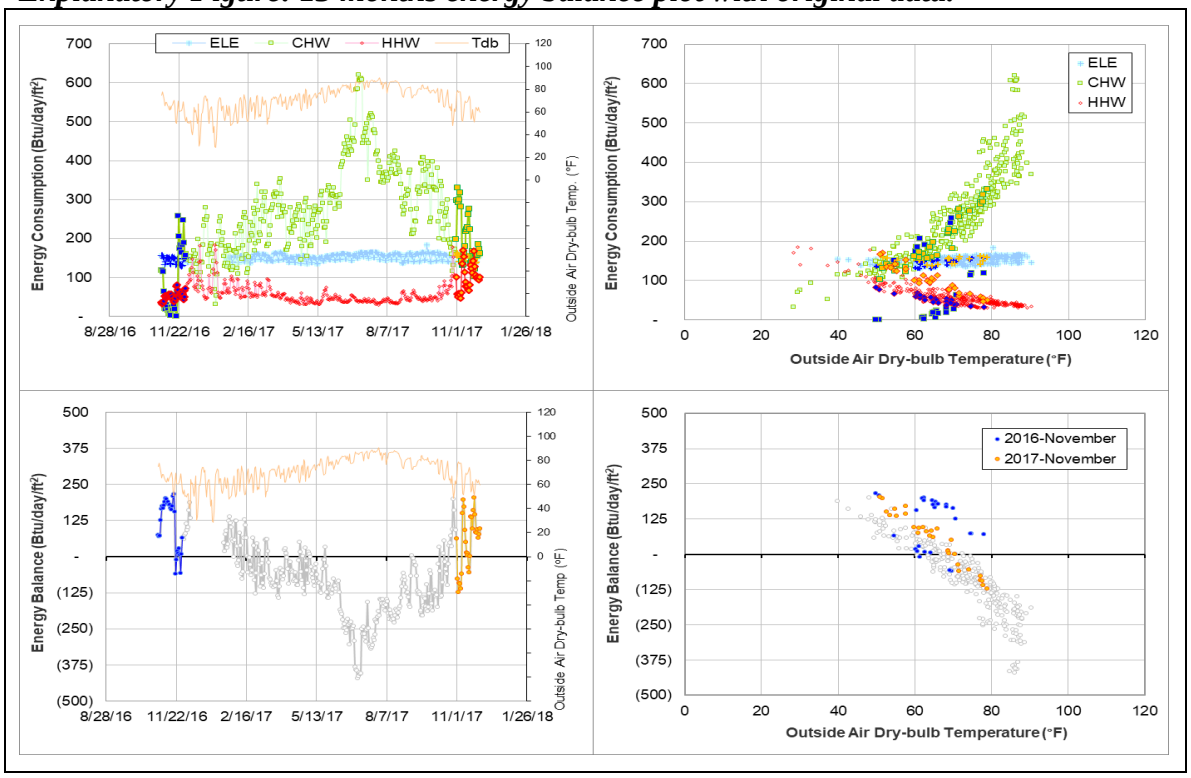
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
HHW	The consumption pattern has changed.	May 2017 – Ongoing

Comments

Starting in May 2017, the HHW consumption pattern increased for Oceanography and Meteorology Building. The pattern increased 30 Btu/day/ft^2 (162%) in warmer temperatures and 34 Btu/day/ft^2 (59%) in cooler temperatures.

Explanatory Figure: 13 months energy balance plot with original data.



Psychology Building (TAMU Bldg #463)

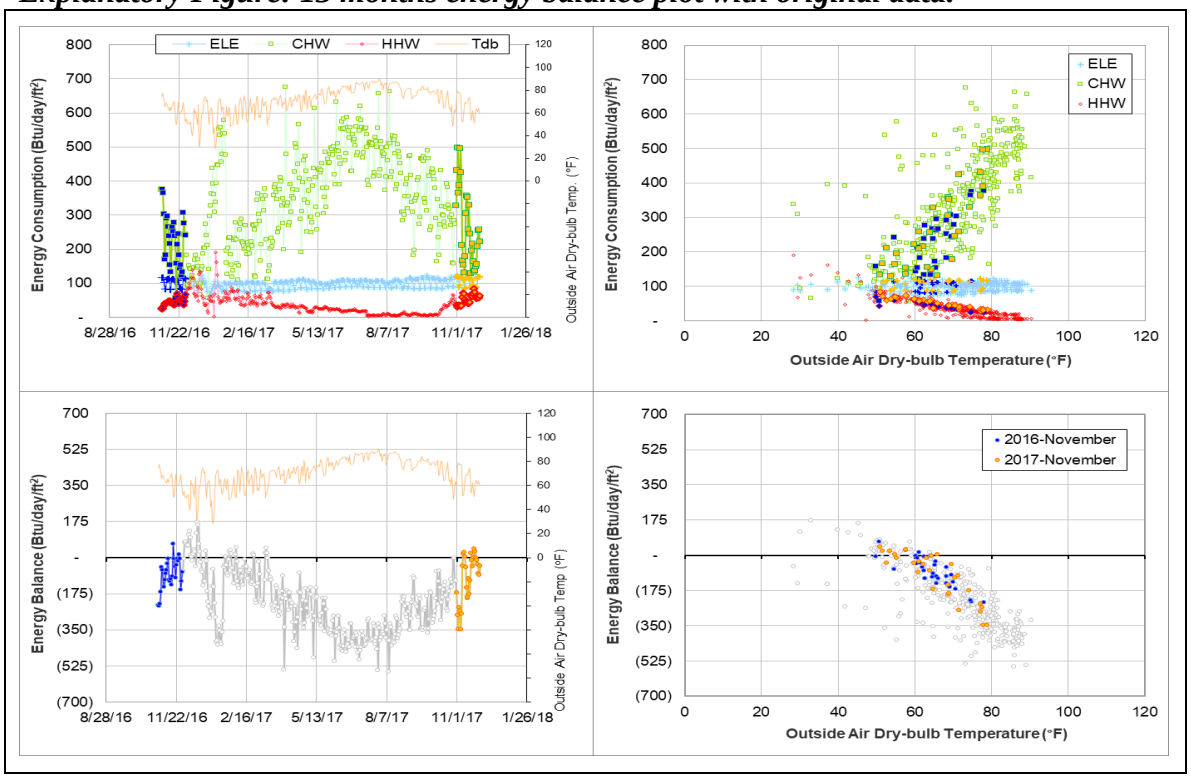
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
Energy balance	The energy balance cross-point temperature is low.	Starting in 2015
CHW	The consumption pattern versus ambient temperature scatters.	Ongoing after ESCO implementation in 2011

Comments

The CHW consumption pattern versus ambient temperature started to scatter after ESCO implementation in 2011. The scatter started to decrease and a weekday/weekend pattern appeared in 2016. The cross-point temperature for this building over the past three years has been low with a range from 50 – 60 °F. More information is needed to determine the cause of the low temperature range.

Explanatory Figure: 13 months energy balance plot with original data.



State Chemist Building (TAMU Bldg #464)

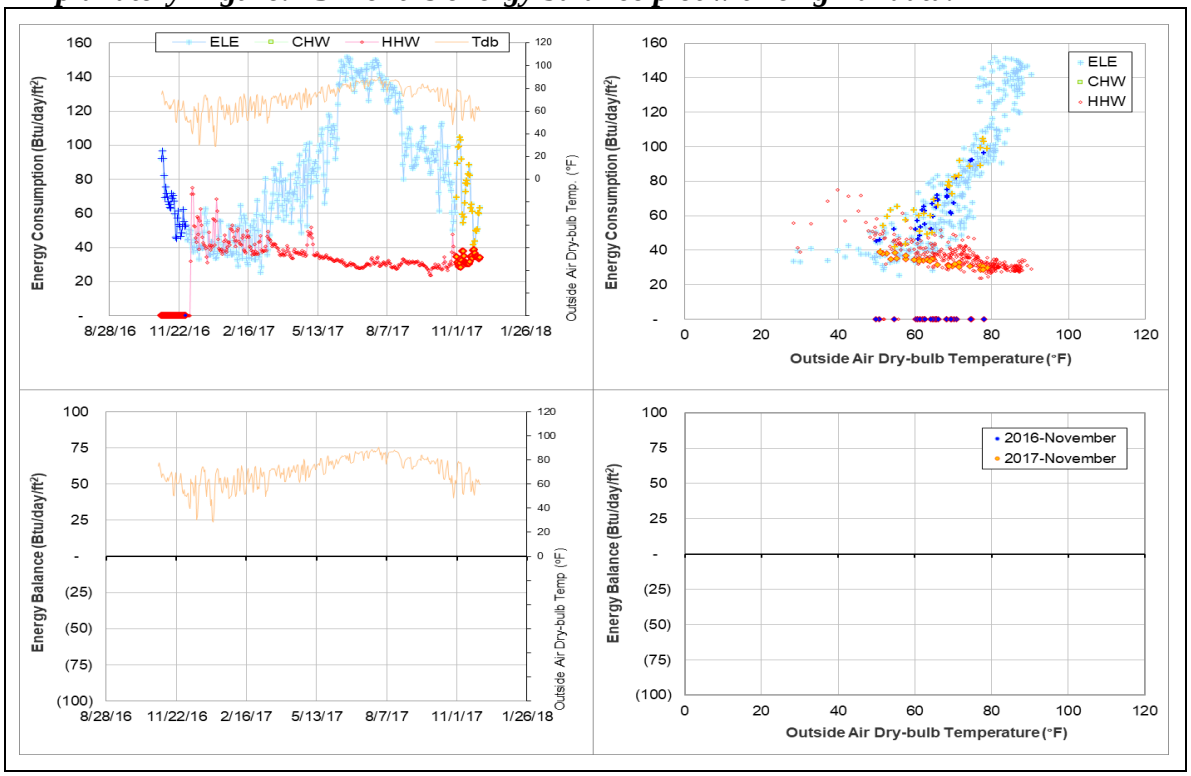
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
ELE #005837	The consumption level decreased especially in low temperature ranges.	11/20/2016 – 10/13/2017
	Scattering data are observed.	6/7/2017 – Ongoing

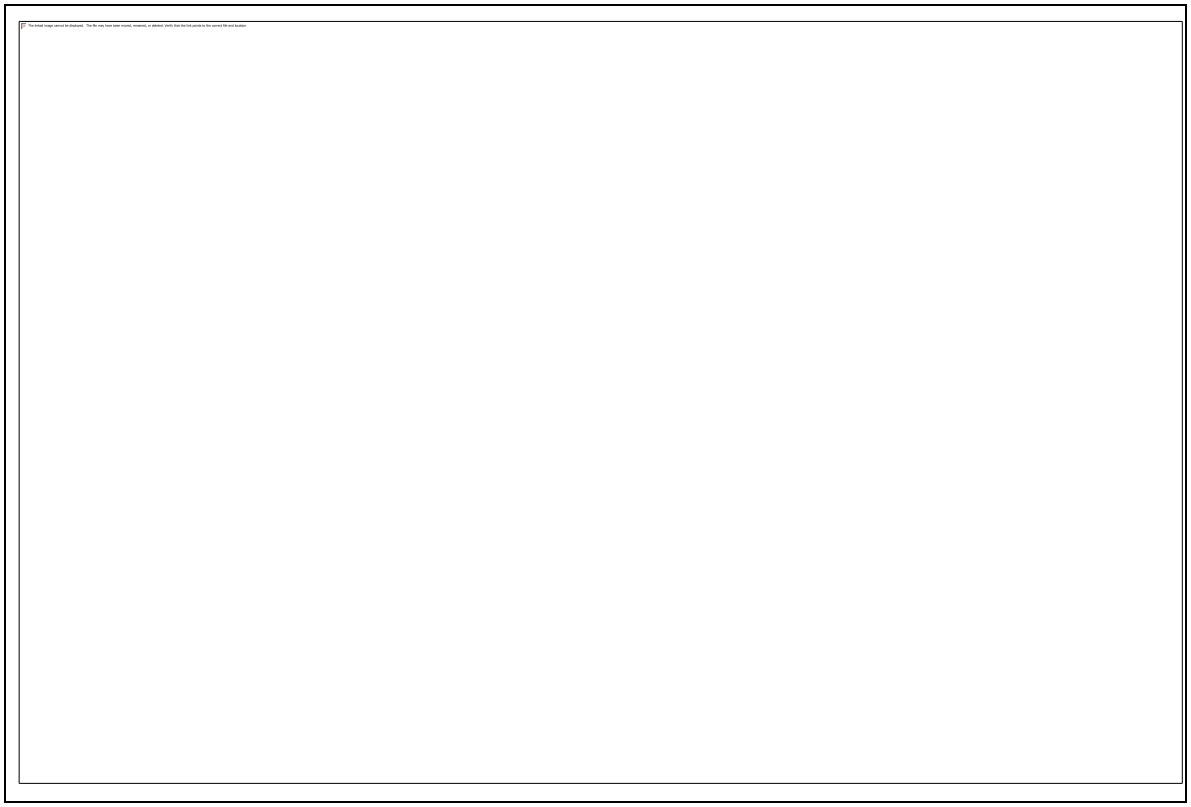
Comments

There are two ELE meters (#005837 and #005839) for this building. Starting in November 2016, the electric consumption pattern for meter #005837 has changed and the data appears scattered. The new pattern decreased in cooler temperatures by 13 Btu/day/ft^2 and increased in warmer temperatures by 10 Btu/day/ft^2. The pattern's slope became steeper. On 11/13/2017, there has been a noticeable increase in electric consumption by 11 – 13 Btu/day/ft^2. Explanatory figures showing the change before and after November 2016 are provided below.

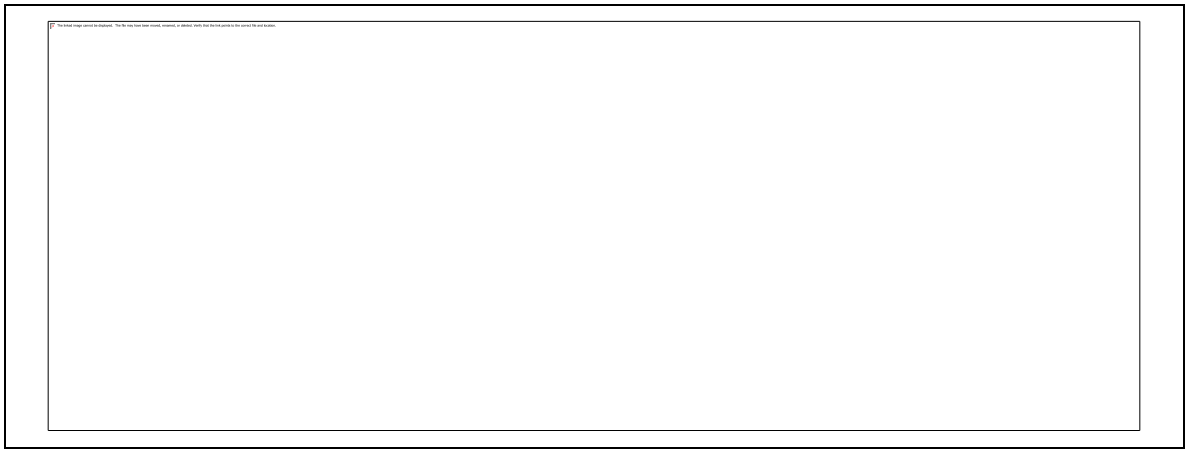
Explanatory Figure: 13 months energy balance plot with original data.



Explanatory Figure: Scatter plot of daily ELE energy consumption for meter #005837 versus outside dry-bulb temperature.



Explanatory Figure: Times series plot of hourly ELE energy consumption for meter #005837 (green) and #005839 (blue) for Jan 2013 through Nov 2017.



Chemistry Building (TAMU Bldg #484)

Detected issues in the energy balance and/or the consumption data

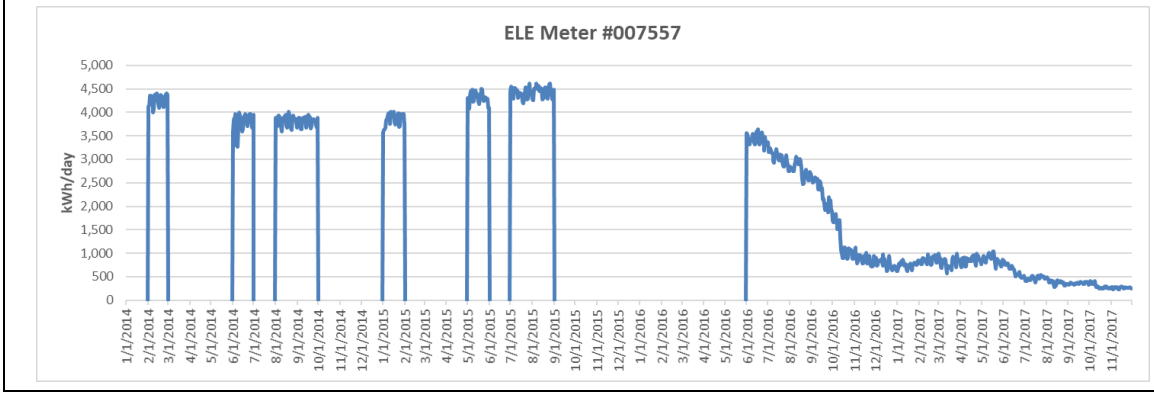
Data Type	Description of data behaviors	Period
ELE #007557	The ELE consumption level has decreased significantly for meter #007557.	6/1/2016 – Ongoing
ELE #007152	The consumption level is increasing gradually for meter #007152.	6/3/2017 – Ongoing

Comments

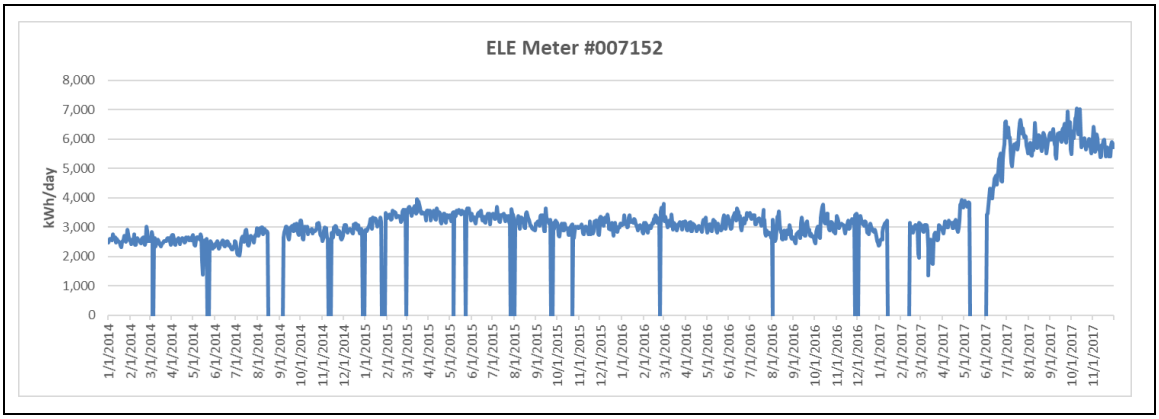
Two of the four ELE meters for this building experienced a change in energy consumption level. ELE meter #007557 consumption decreased gradually during 6/1/2016 – 8/31/2016 by over 2000 kWh/day and then decreased further on 6/17/2017 by another 500 kWh/day. On 10/11/2017, electric consumption decreased again by almost 100 kWh/day.

ELE meter #007152 consumption gradually increased after a missing period (5/10/2017 – 6/2/2017) by about 3000 kWh/day.

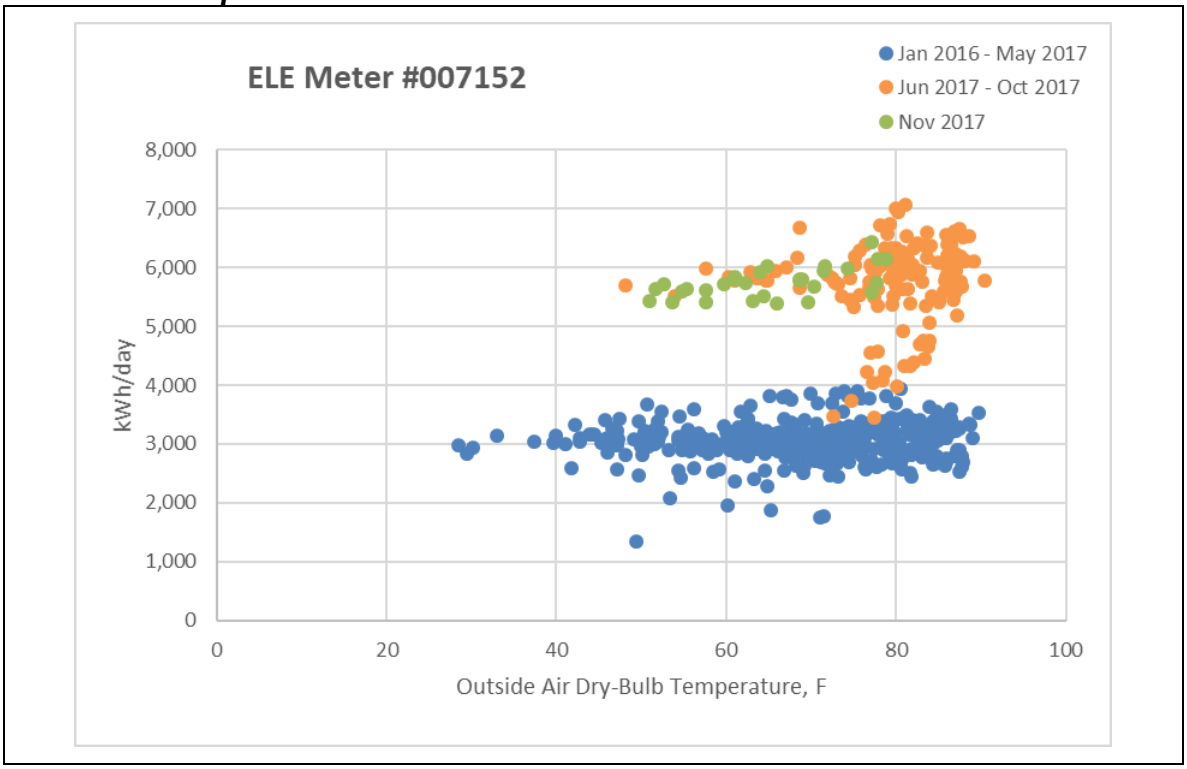
Explanatory Figure: Times series plot for meter #007557 from 1/1/2014 – 10/31/2017.



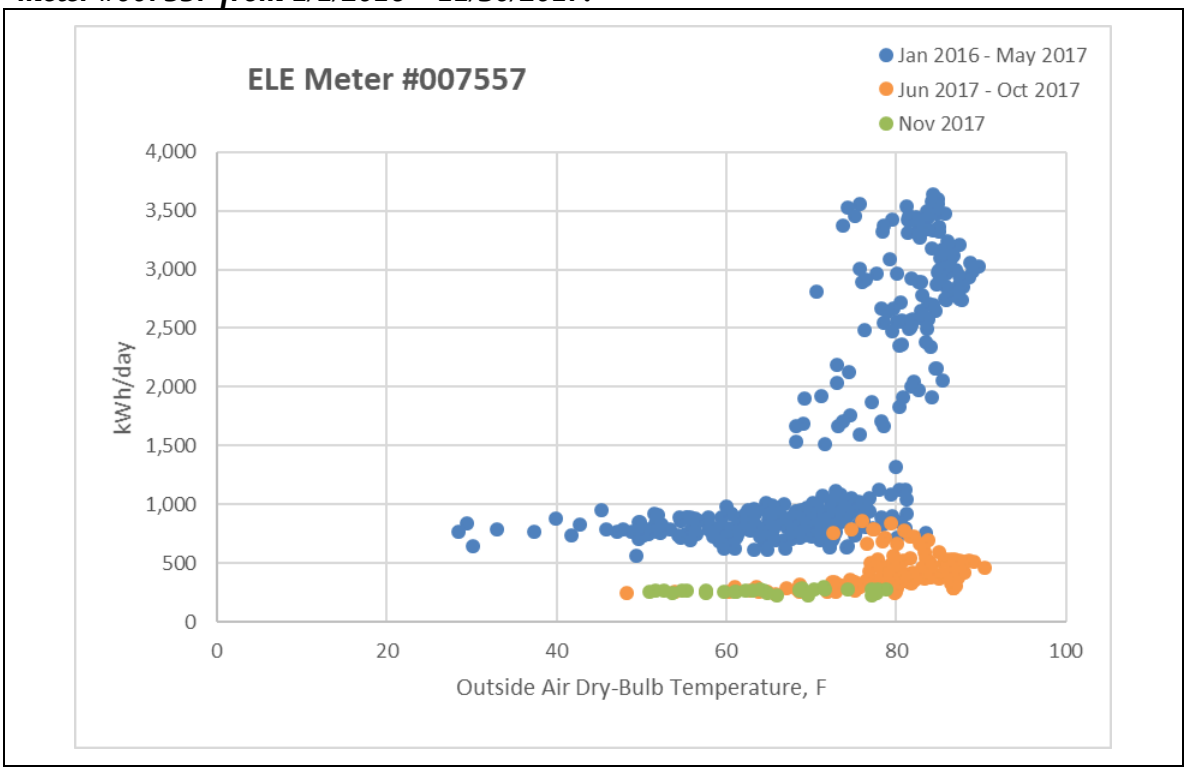
Explanatory Figure: Time series plot of electric meter #007152 from 1/1/2016 – 10/31/2017.



Explanatory Figure: Scatter plot of kWh/day versus outside air temperature for electric meter #007152 from 1/1/2016 – 11/30/2017.



Explanatory Figure: Scatter plot of kWh/day versus outside air temperature for electric meter #007557 from 1/1/2016 – 11/30/2017.



Utilities & Energy Services Central Office (TAMU Bldg #496)

Detected issues in the energy balance and/or the consumption data

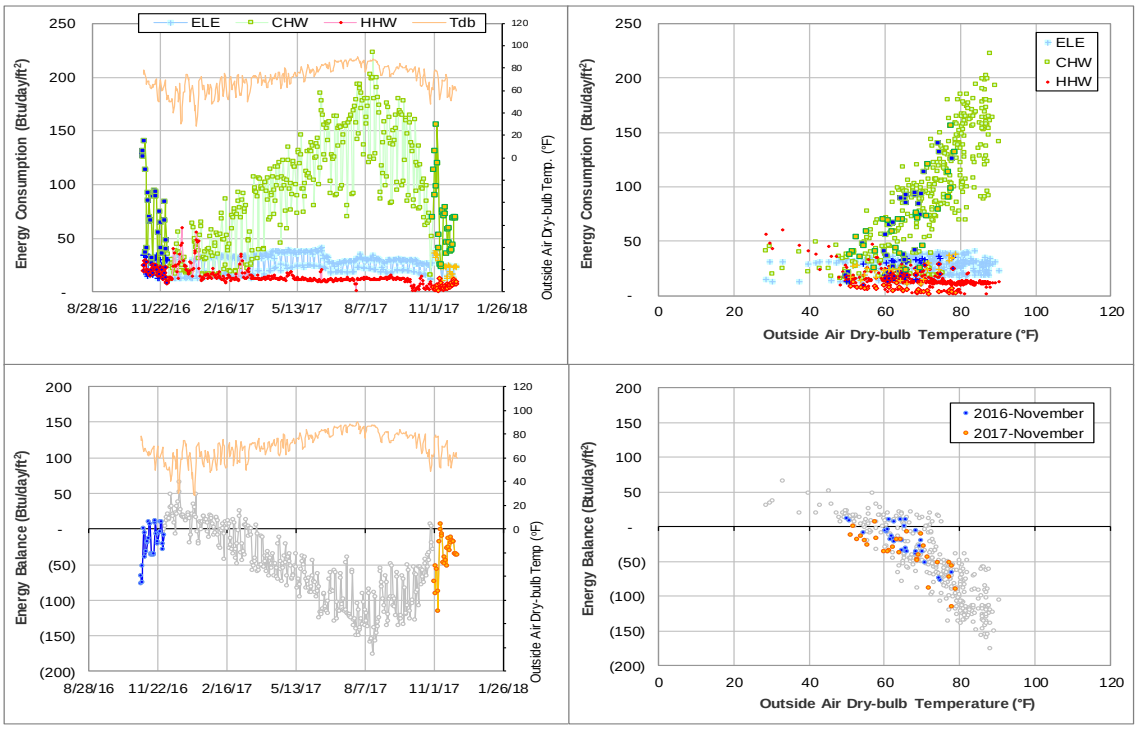
Data Type	Description of data behaviors	Period
ELE, CHW, and HHW	The energy use per unit floor area is low compared to other buildings.	Since the data became available on 7/1/2012

Comments

The peak electric use intensity is around 0.65 W/ft^2, which is small for an office building on campus. The delta-T for HHW seems to be small for years. The CHW and HHW consumption per unit floor area also seem to be low. It is possible that the GSF on file (46,110 ft^2) includes substantial unoccupied or unconditioned areas.

The energy balance scatter is due to the consumption level changes for CHW and HHW. The cross-point temperature of the energy balance is in the range of 50 to 75°F.

Explanatory Figure: 13 months energy balance plot with original data.



Nagle Hall (TAMU Bldg #506)

Detected issues in the energy balance and/or the consumption data

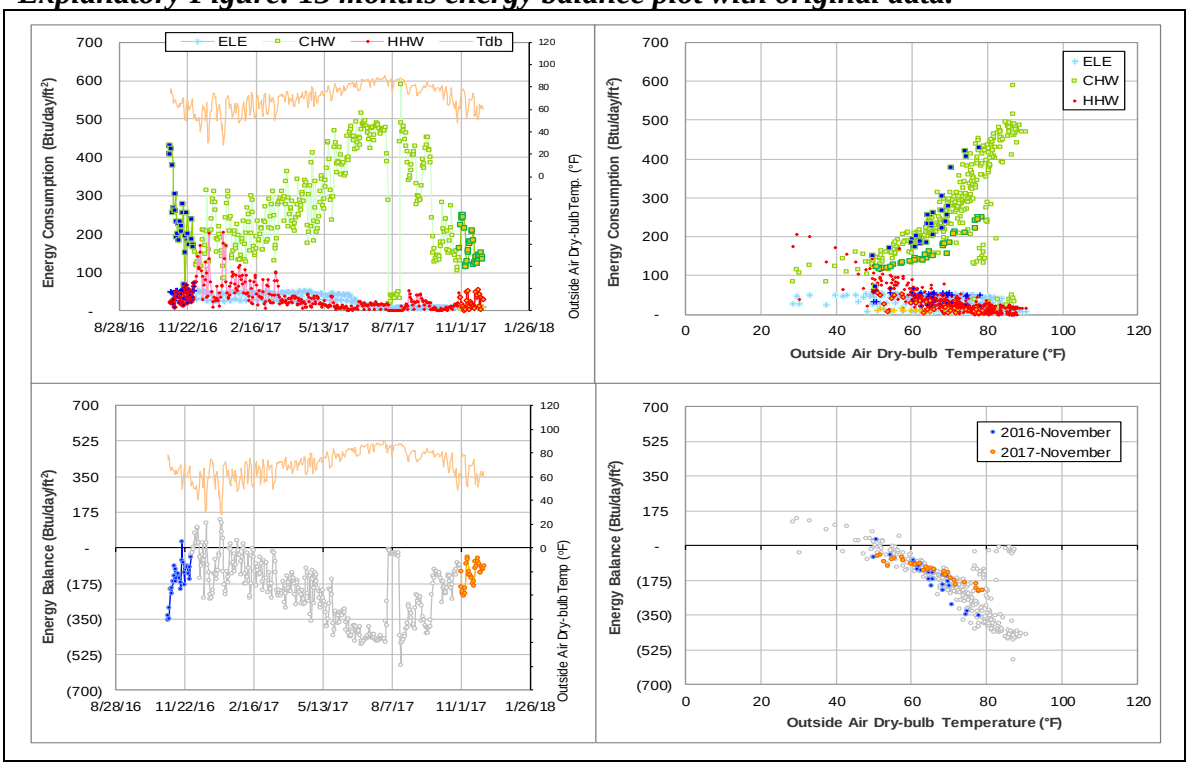
Data Type	Description of data behaviors	Period
Energy Balance	The level was low and the cross-point temperature is around 50°F.	Since the data became available
ELE	The consumption per unit floor area is smaller than those for other similar office buildings, and has been decreasing gradually in the past 4 years.	Since the data became available
	The consumption levels decreased largely.	Since June 2017
CHW and HHW	The consumption levels decreased.	Since October 2017

Comments

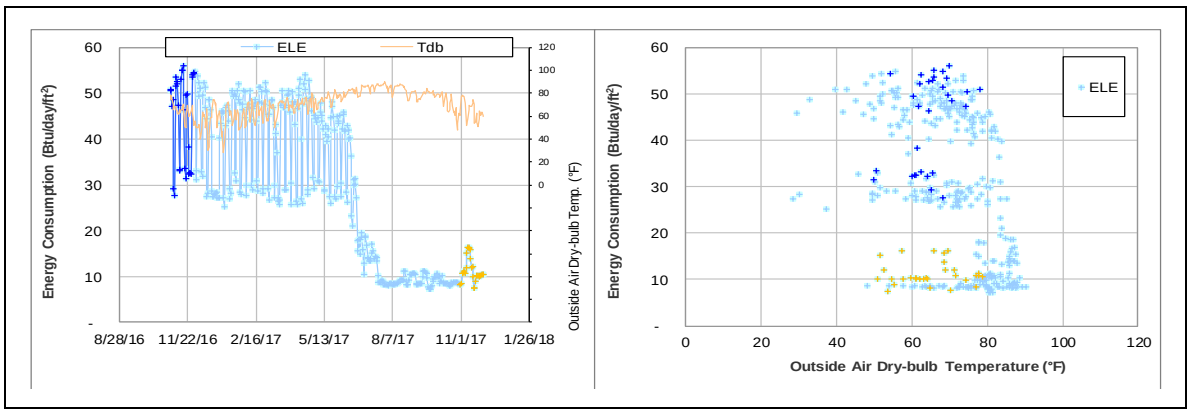
The ELE consumption is lower than 50 Btu/day/ft^2, lower than the typical level of 100 Btu/day/ft^2 for office buildings on campus. This meter might not cover the whole building or it is erroneously factored. The ELE consumption decreased further in July 2017, which could be related to the renovation.

The CHW and HHW consumption levels also decreased in October 2017, but the patterns do not look problematic. It is reported this building is undergoing renovation.

Explanatory Figure: 13 months energy balance plot with original data.



Explanatory Figure: 13 months ELE consumption plot with original data



Heep Laboratory Building (TAMU Bldg #511)

Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
ELE	The consumption is decreasing gradually.	Since February 2017
CHW	The consumption decreased.	Since April 2017
HHW	The flow rate dropped and became unstable.	Since May 2017

Comments

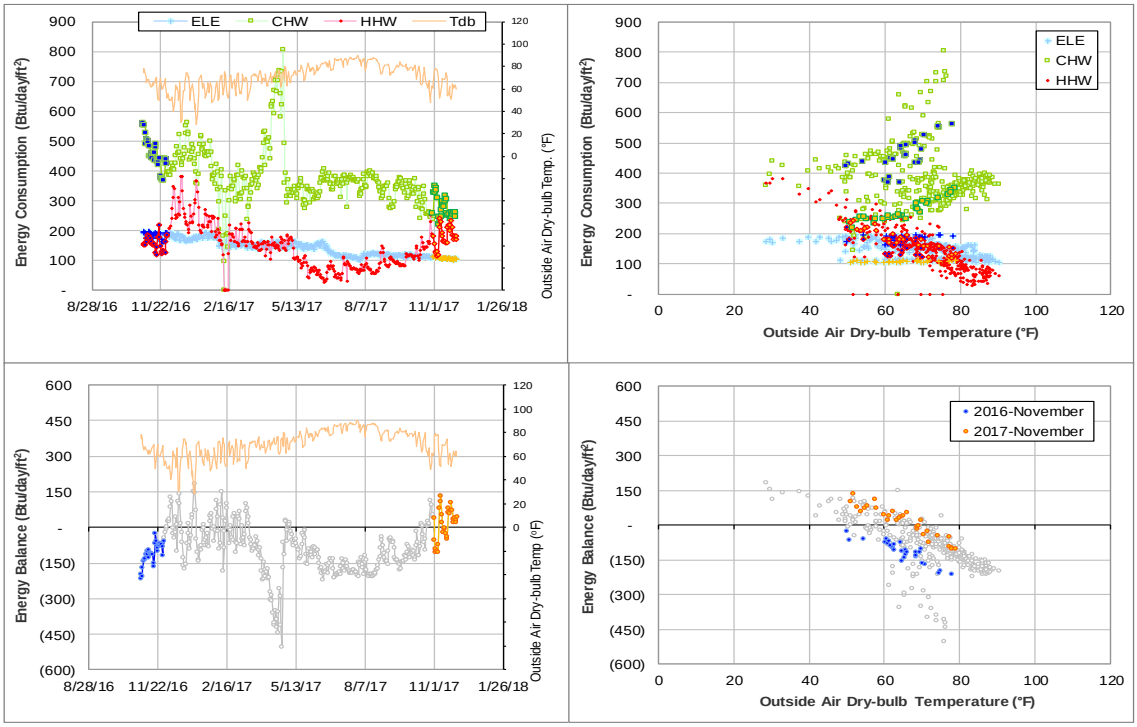
The ELE consumption gradually slided down from near 200 Btu/day/ft^2 at the beginning of February 2017 to about 160 Btu/day/ft^2 at the beginning of May 2017. The consumption level further dropped to 110 – 120 Btu/day/ft^2 during summer. There is no identified cause of this change.

The CHW supply temperature sensor drifted during March 2017 and April 2017 and then seemed to have been repaired on 4/27/2017. The consumption level was since then significantly lower than before. The supply temperature has been higher than its hydraulically closest buildings by about 1°F. A possible reason is that the CHW pipeline goes through inside of #0468 Evans Annex, but there was no difference before the this meter drifted in late March 2017. An inspection of this meter is suggested.

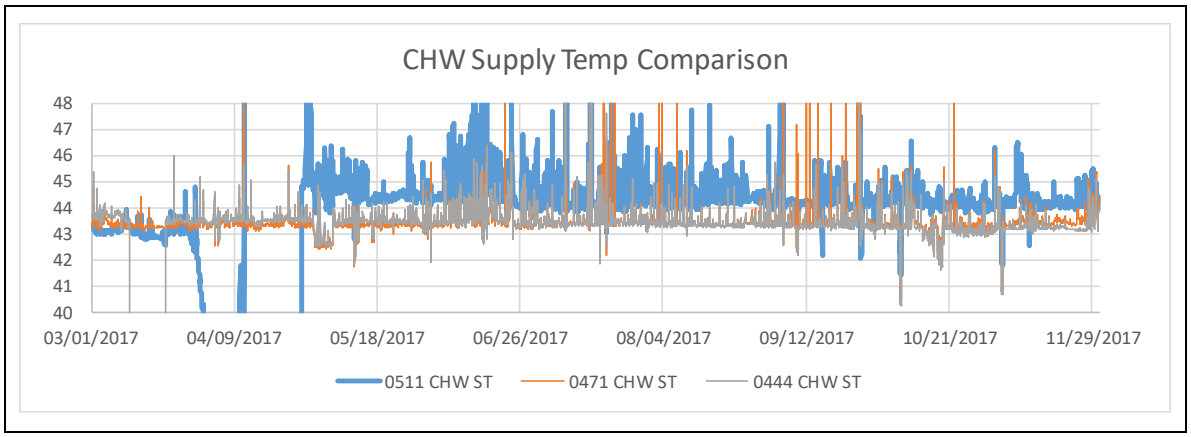
The HHW flow rate dropped on 5/8/2017 and became unstable.

This building is in ESCO list. The consumption decrease could all be related to this.

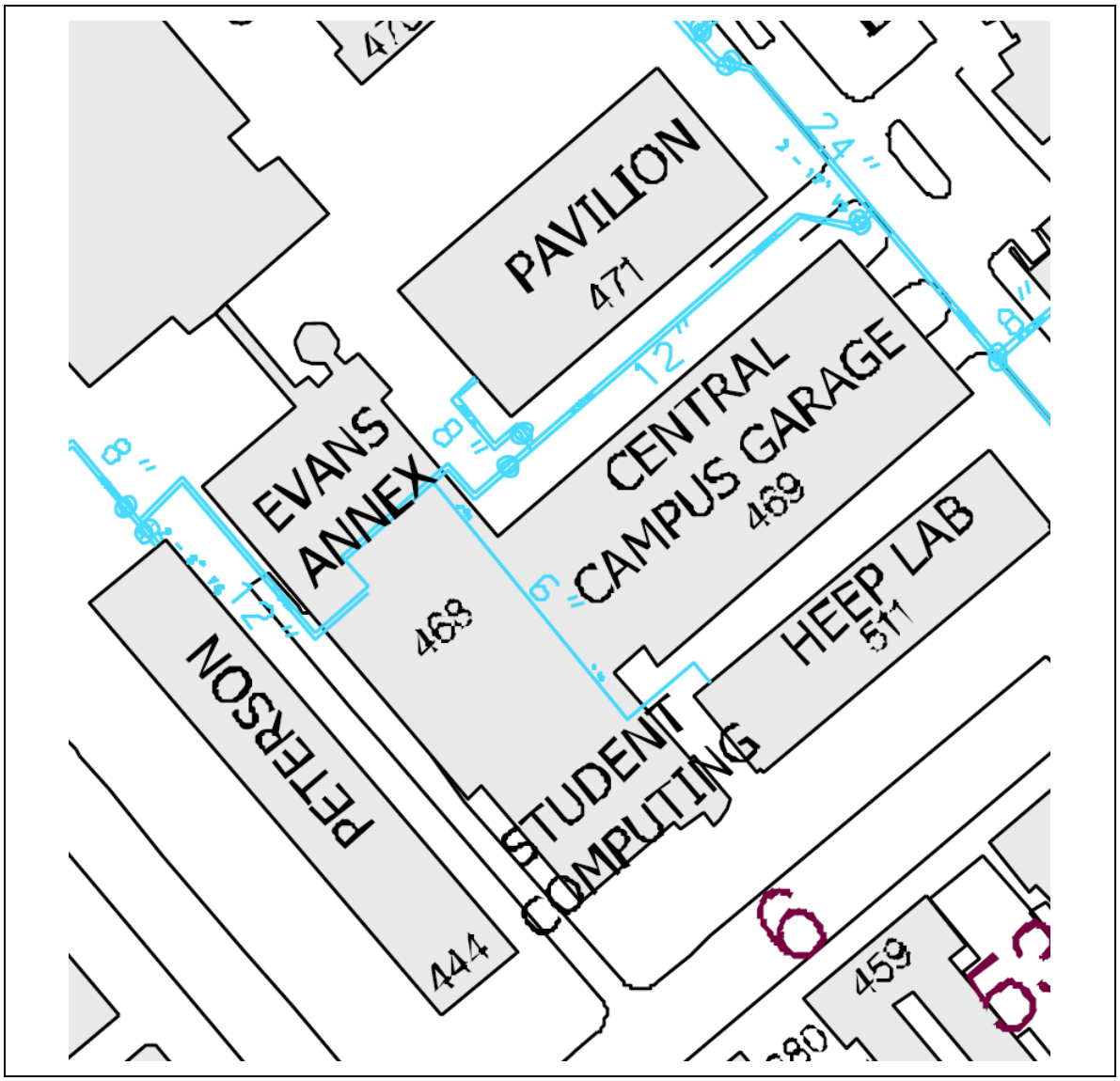
Explanatory Figure: 13 months energy balance plot with original data



Explanatory Figure: CHW supply temp comparison of hydrologically closest buildings.



Explanatory Figure: CHW pipeline map near #0511.



All Faiths Chapel (TAMU Bldg #512)

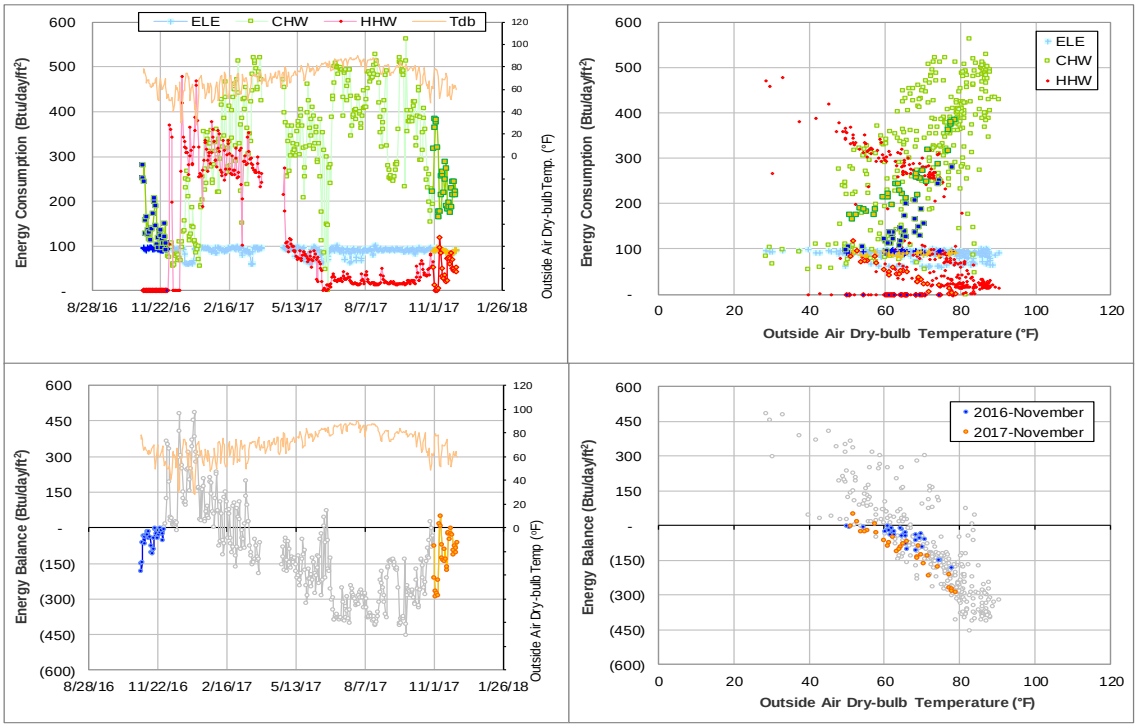
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
HHW	The consumption decreased.	Since June 2017

Comments

HHW of this building started to have very low Delta-T values since June 2017, resulting in a further decrease of its consumption level. Its flow rate has also been greatly fluctuating. The delta-T seems to be very low. An inspection of the temperature sensor is suggested.

Explanatory Figure: 13 months energy balance plot with original data



Munnerlyn Astronomy & Space Sciences Engineering (TAMU Bldg #514)

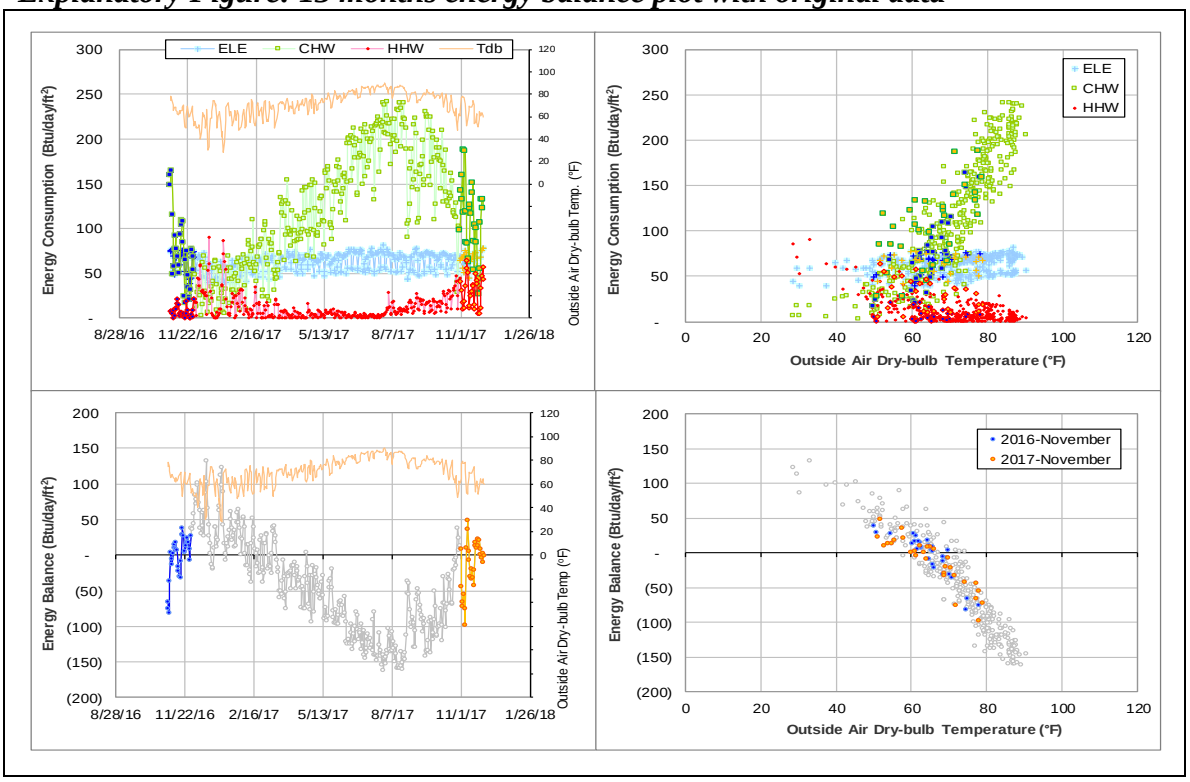
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
CHW	The consumption increased for some days.	Since June 2017

Comments

CHW consumption would be higher than the main pattern for uncertain days since June 2017. These days cause a scattered looking to the plots. There is no obvious meter reading anomaly observed.

Explanatory Figure: 13 months energy balance plot with original data



Computing Services Center (TAMU Bldg #516)

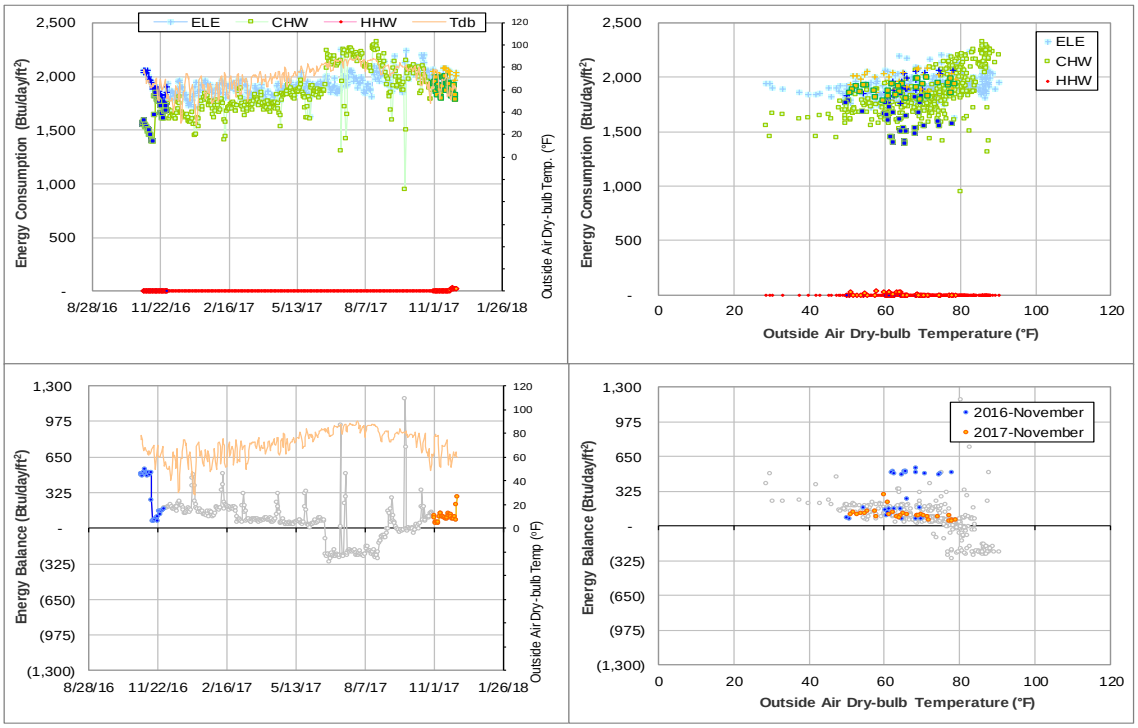
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
CHW	The consumption increased.	Since June 2017

Comments

CHW flow rate increased from the range of 400 – 520 gpm to 480 – 560 gpm since 6/19/2017 resulting in a significant increase in CHW consumption. This building is reported to be under renovation.

Explanatory Figure: 13 months energy balance plot with original data



Beutel Health Center (TAMU Bldg #520)

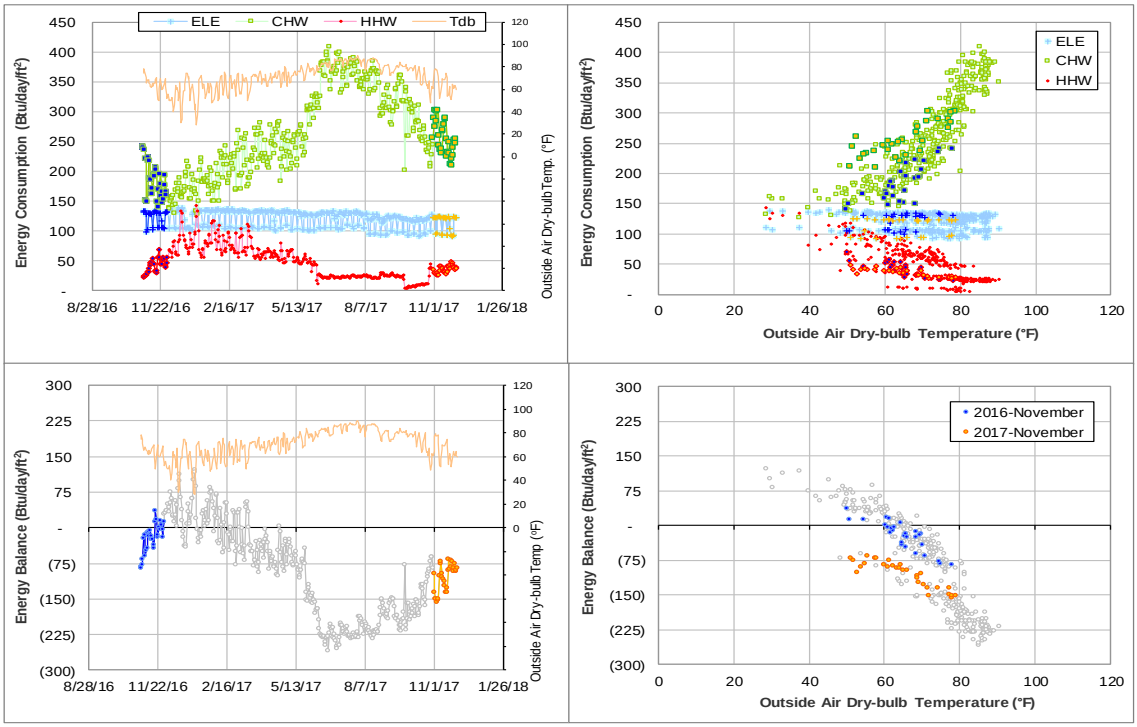
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
EB	The cross-point dropped from 65 – 70°F to too low to cross.	Since June 2017
HHW	The consumption decreased.	Since June 2017

Comments

The HHW flow rate and Delta-T decreased on 6/25/2017 but the consumption pattern seems stable. The consumption also returned to this decreased level after a problematic period on 9/25/2017 – 10/26/2017. This decrease of HHW also significantly pulled down the energy balance, which is now too low to cross the abscissa axis. See also II-2.

Explanatory Figure: 13 months energy balance plot with original data



Blocker Building (TAMU Bldg #524)

Detected issues in the energy balance and/or the consumption data

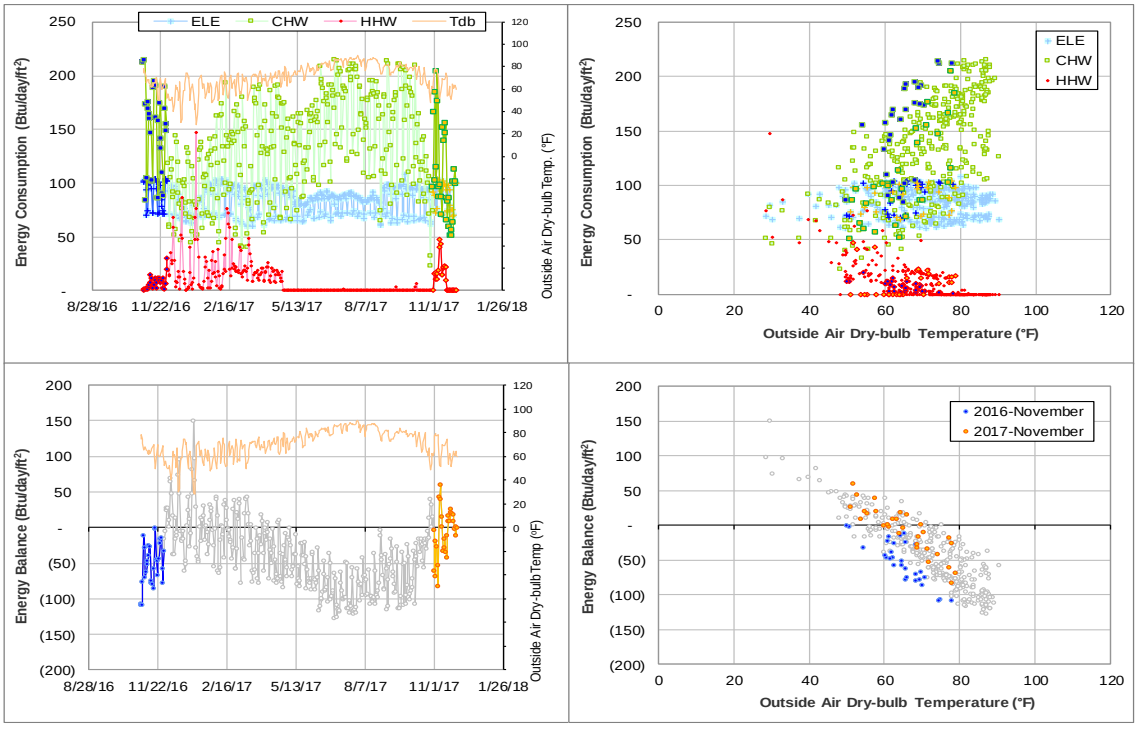
Data Type	Description of data behaviors	Period
CHW	The consumption decreased and is about 50 Btu/day-ft^2 (25%) lower than the level of the past year.	Since May 2017
HHW	The consumption level is low.	Past several years

Comments

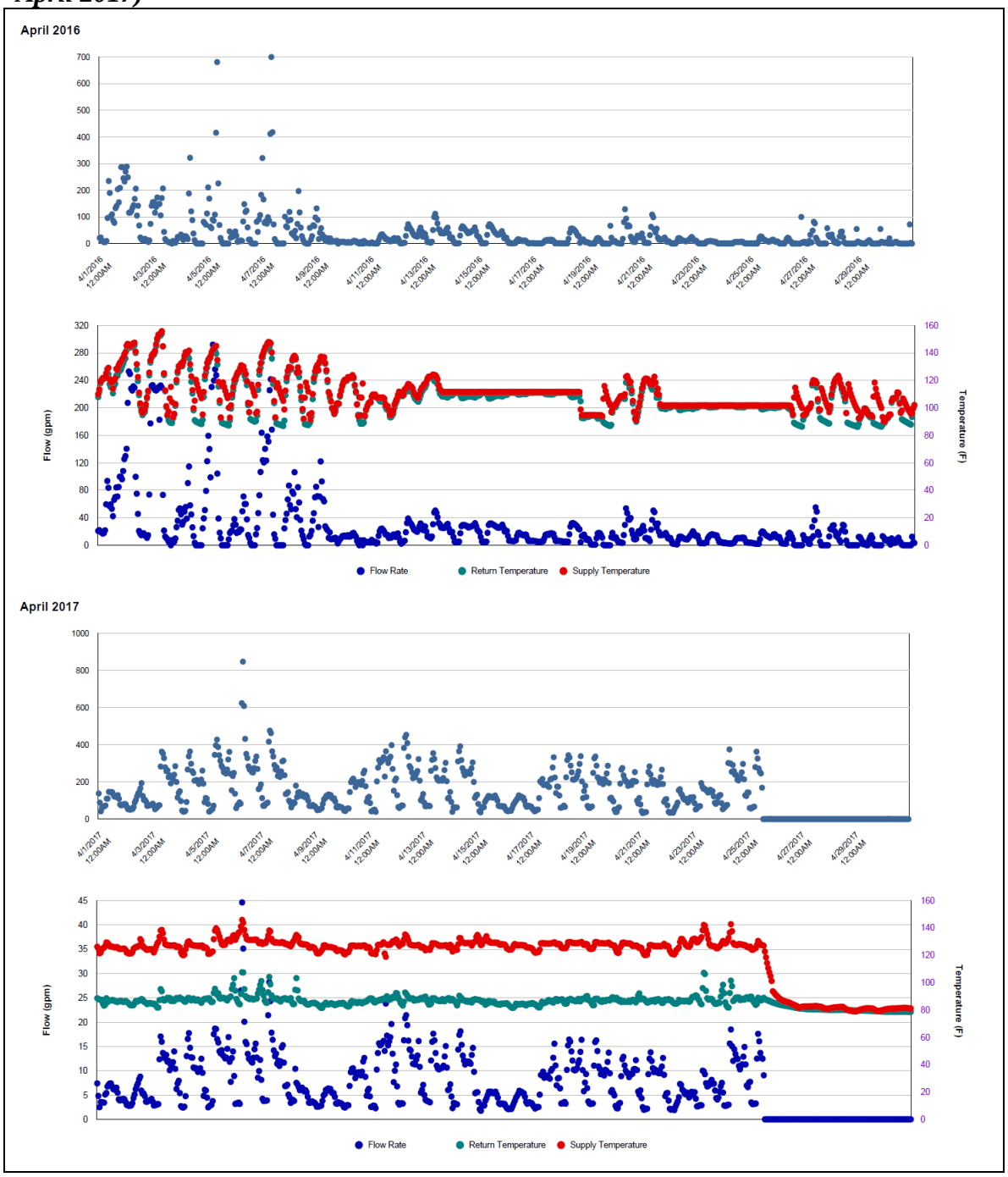
The cross-point of temperature of energy balance had been lower than 60°F for years. But the recent decrease of CHW pulled energy balance up and now it crosses between 60 and 70°F.

The delta-T and consumption level for HHW seemed low for the past couple of years and started to change in an unstable fashion in February 2017. The explanatory figures below show the change in Delta-T of April 2016 and April 2017. HHW seemed closed off since the end of April. This increase also contributed to the higher and more reasonable cross-point of energy balance. It continues to seem closed off during the non-heating season.

Explanatory Figure: 13 months energy balance plot with original data



Explanatory Figure: Time series plots of hourly HHW energy consumption, flow rate, and supply and return temperatures from the utilities office. (Top: April 2016; Bottom: April 2017)



Neeley Residence Hall (TAMU Bldg #652)

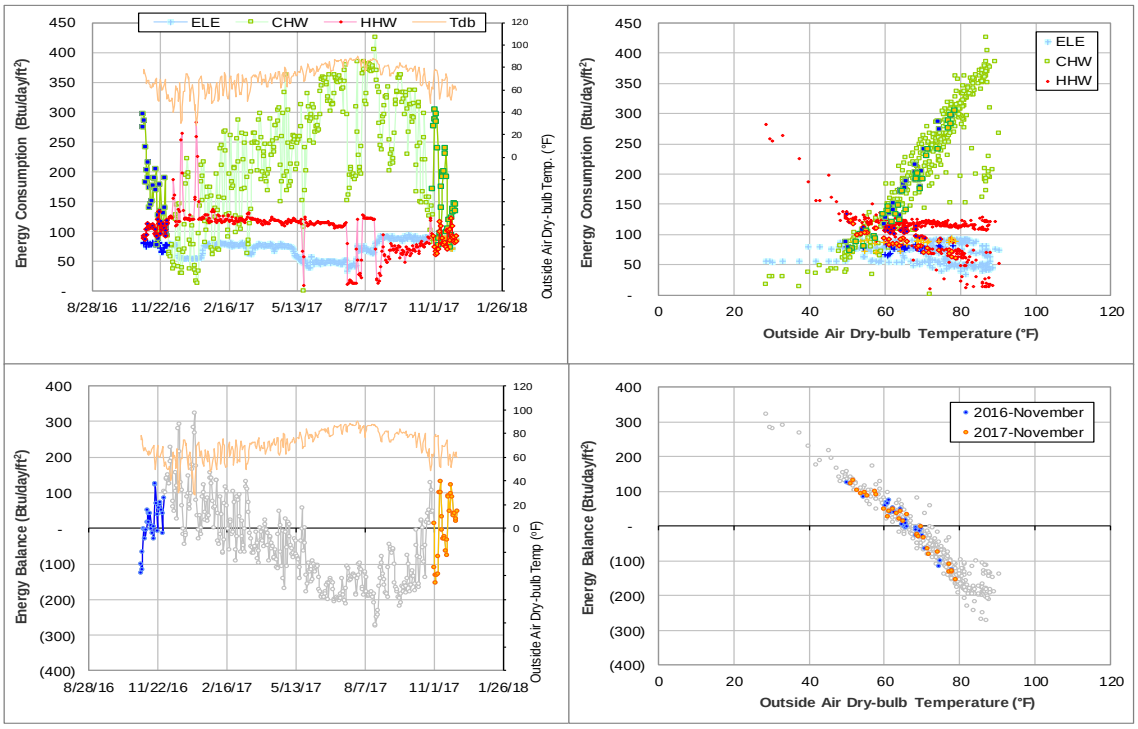
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
HHW	The consumption decreased.	Since August 2017

Comments

HHW flow rate dropped from its normal rate of 22 – 27 gpm to 2 – 14 gpm since 8/20/2017. This behaviour showed in the last year too. There is no obvious disturbance observed in energy balance.

Explanatory Figure: 13 months energy balance plot with original data



McNew Laboratory (TAMU Bldg #740)

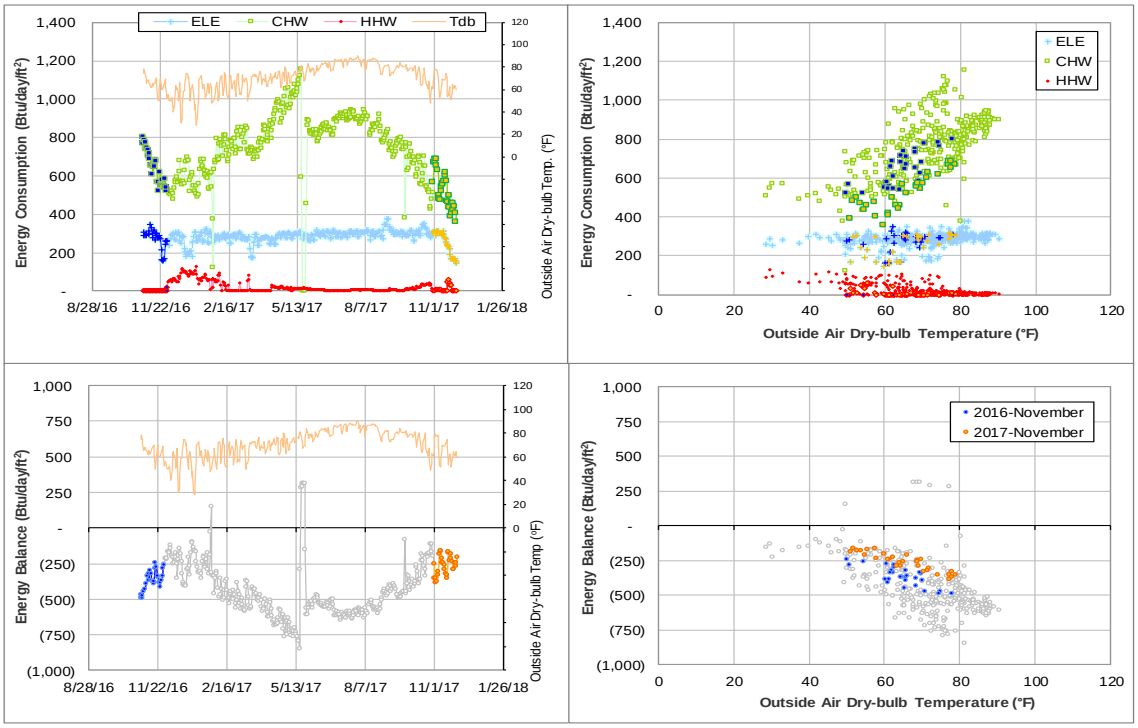
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
Energy Balance	The energy balance pattern level is low.	Past several years
HHW	The consumption level seems low.	Past several years

Comments

The energy balance level has consistently been low and does not even reach a cross-point temperature. Since 2013, there has been a large decrease in HHW use. After that, HHW consumption decreased gradually year by year. Recently, the CHW has increased starting February 2017, causing the energy balance to reduce even more. More information is needed to help identify the reason causing the low energy balance for this building.

Explanatory Figure: 13 months energy balance plot with original data



Texas Vet Med Diagnostic Lab (TAMU Bldg #1041)

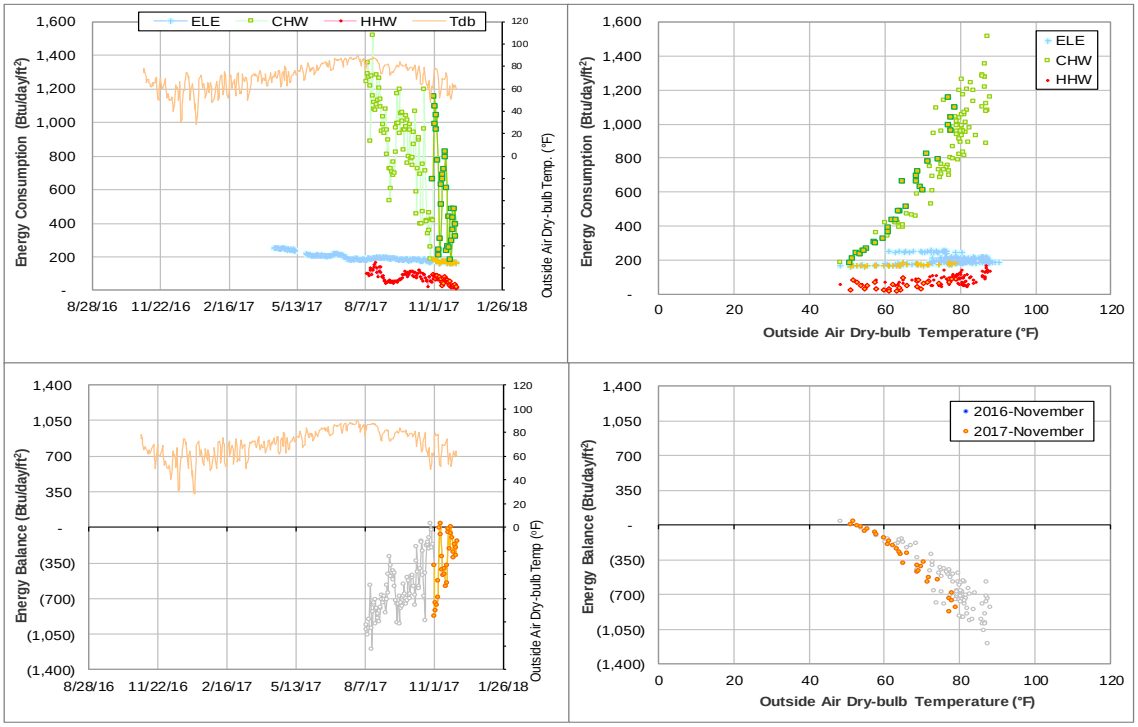
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
Energy Balance	The energy balance has a cross-point at 50°F.	Since the data became available in August 2017

Comments

The energy balance of this building has a cross-point as low as 50°F. This may be caused by its very high level of CHW consumption. However, the data of this building have only became available in August 2017 and its systems may still be subject to adjustments.

Explanatory Figure: 13 months energy balance plot with original data



Physical Plant Administration & Shops (TAMU Bldg# 1156)

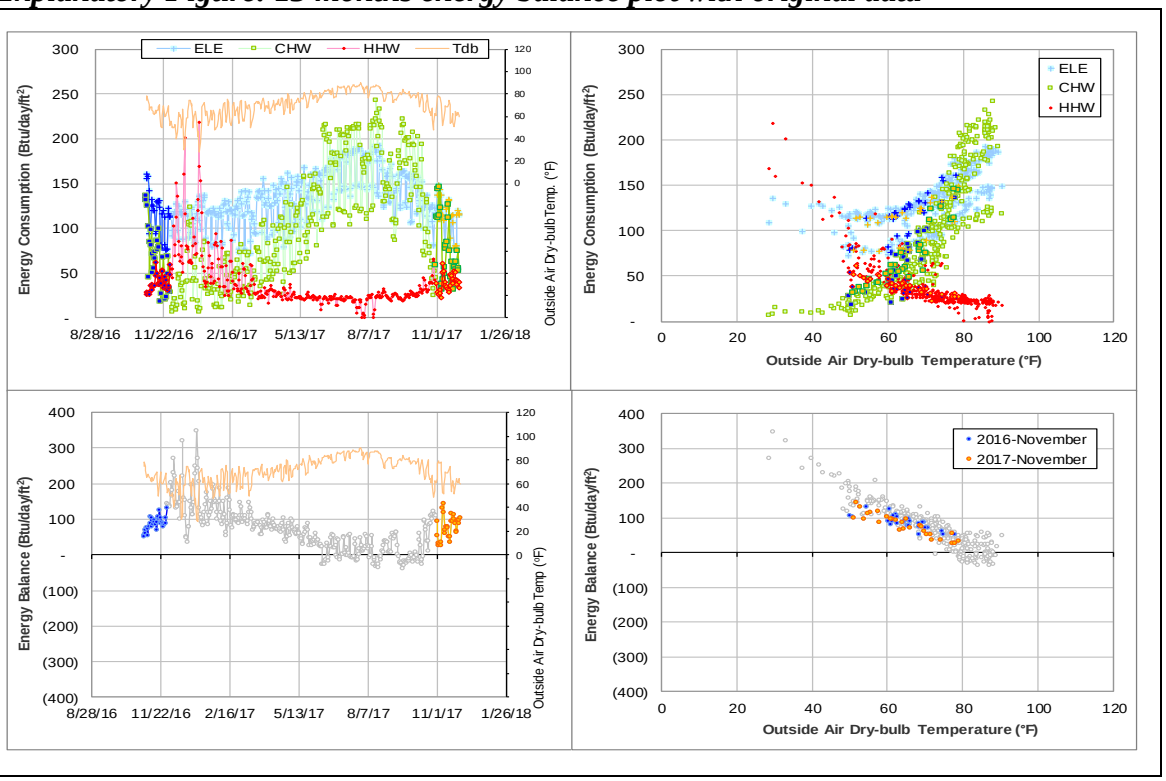
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
Energy Balance	The cross-point temperature is as high as 85°F.	Since 7/1/2014 when ELE became available
CHW	The consumption level seems low compared to the ELE and HHW use level.	Since the data became available on 7/1/2012.
	The weekend level decreased to farther from weekday level.	Since 2017.

Comments

The electricity is not available until 7/1/2014. CHW consumption level seems low compared to the ELE and HHW use level, but the CHW consumption has a clean and stable pattern since the data became available on 7/1/2012. More information is needed to identify which type of utility causes the high cross-point temperature. It is possible that the GSF on file (101,704 ft^2) includes substantial unoccupied or unconditioned areas. Since 2017, the weekday and weekend separation of CHW consumption patterns have a larger split.

Explanatory Figure: 13 months energy balance plot with original data



Price Hobgood Ag. Engineering Research Lab (TAMU Bldg #1508)

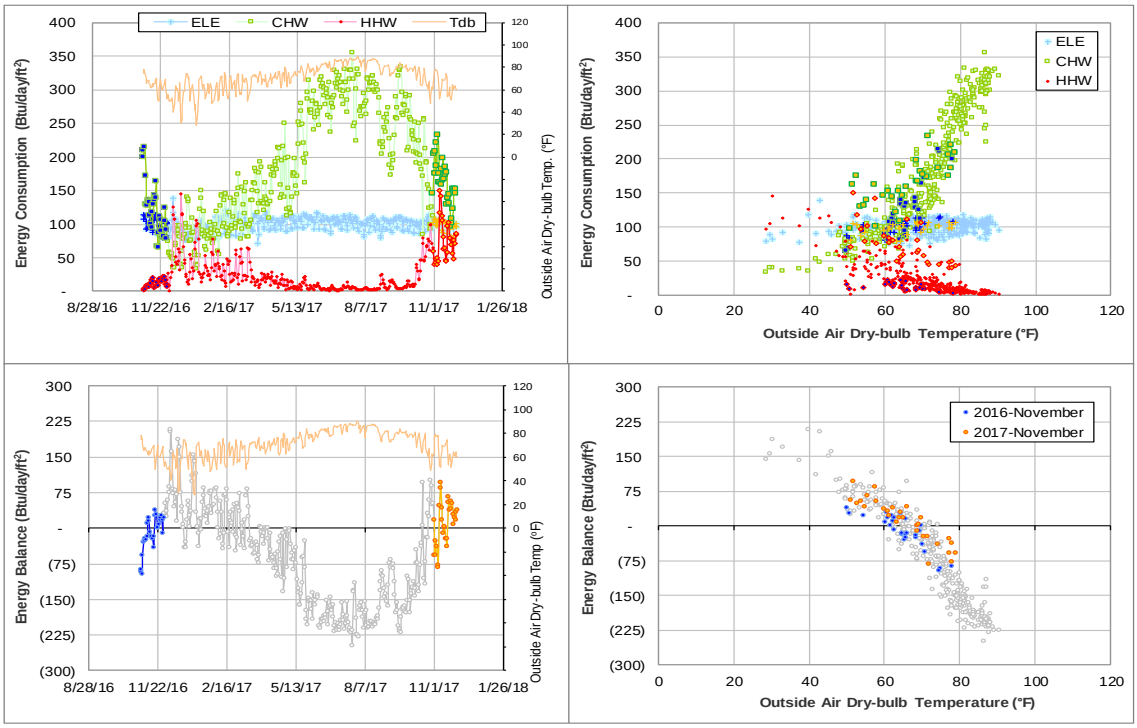
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
CHW	The consumption increased.	Since November 2017
HHW	The consumption increased.	Since November 2017

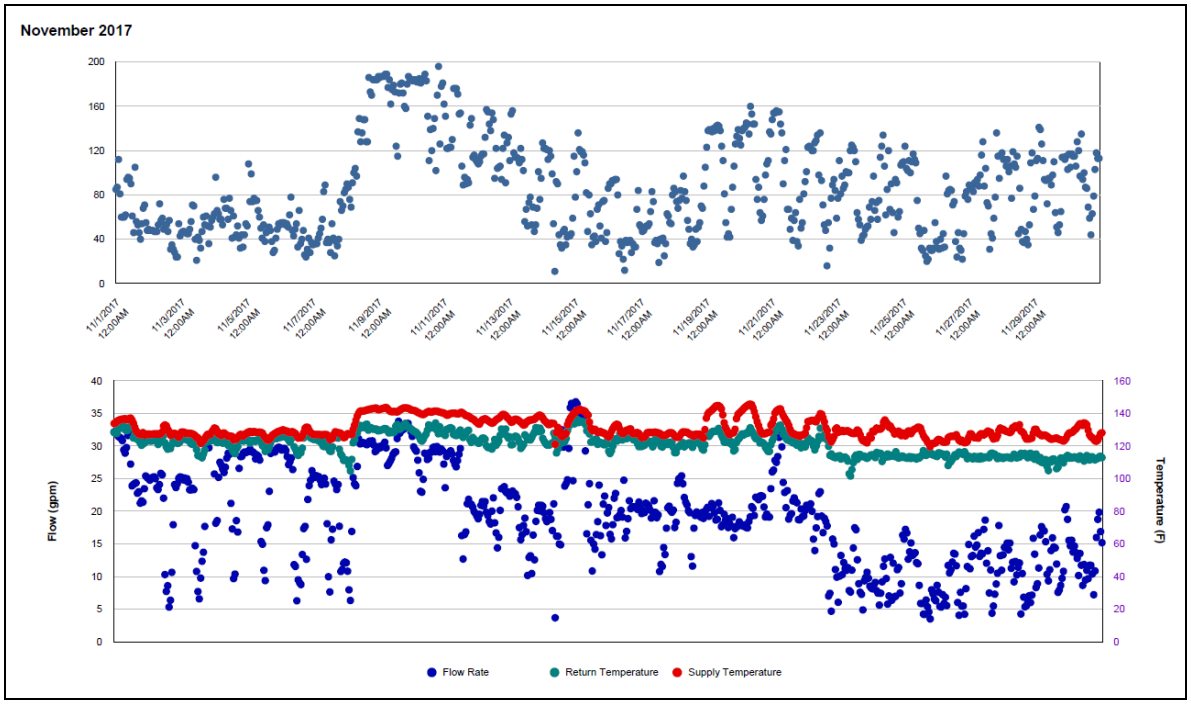
Comments

HHW supply temperature of this building increased on 11/8/2017 causing a significant increase to HHW as well as CHW consumption. However, this is not suspected to be a meter malfunction as this HHW supply temperature increase is also observed in other buildings, thus it is possibly a plant operation change.

Explanatory Figure: 13 months energy balance plot with original data



Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office. (HHW during November 2017)



Medical Sciences Library (TAMU Bldg# 1509)

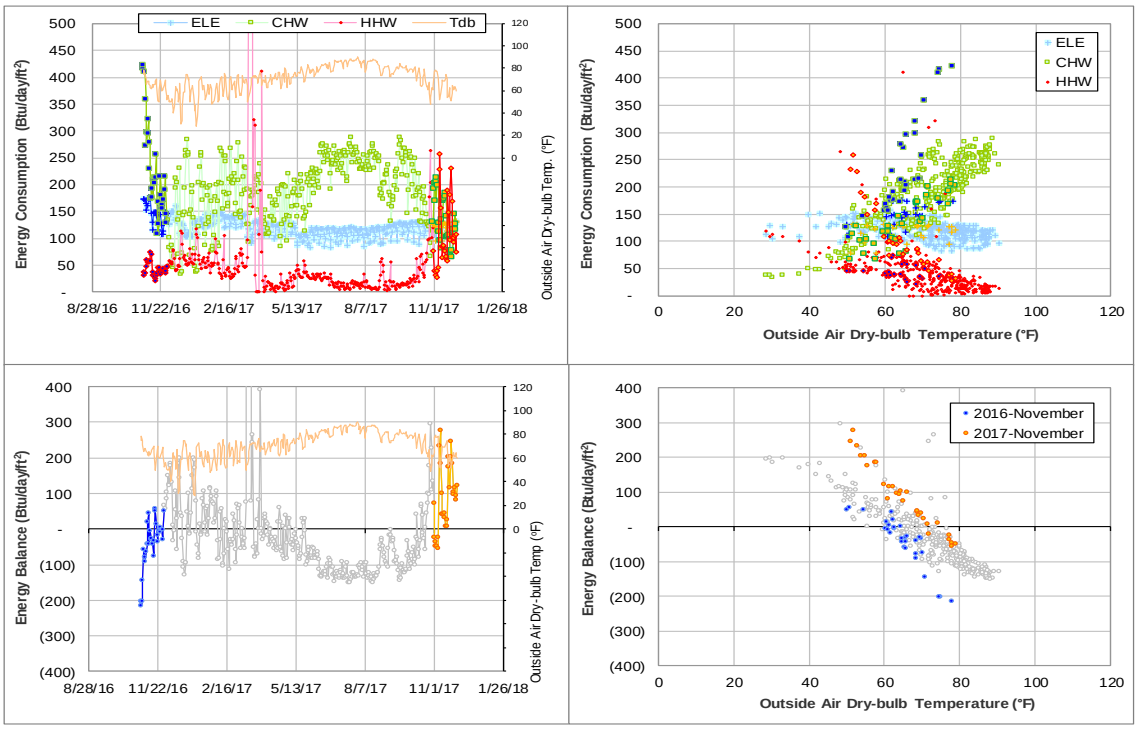
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
ELE, CHW, and HHW	Consumption decreased significantly.	Since March 2017
HHW	Consumption increased again.	Since October 2017

Comments

The consumption of all utilities of this building decreased since March 2017. The decrease of CHW is the most significant. However, the HHW consumption increased again to a level higher than the last year in October. This building is reported to be in ESCO III.

Explanatory Figure: 13 months energy balance plot with original data



Cox-McFerrin Center for Aggie Basketball (TAMU Bldg# 1558)

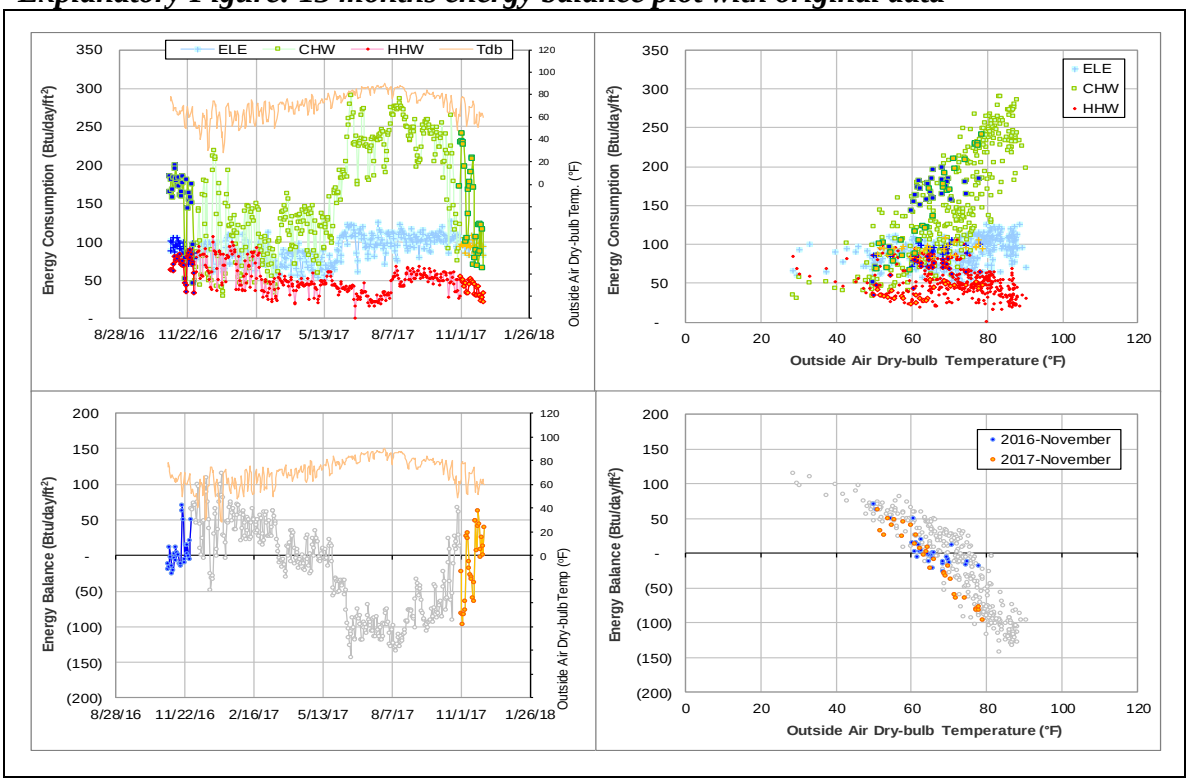
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
HHW	Consumption pattern is not weather dependent.	Since November 2016

Comments

The HHW pattern remains scattered and does not appear to be weather dependent.

Explanatory Figure: 13 months energy balance plot with original data



International Ocean Discovery Building (TAMU Bldg# 1601)

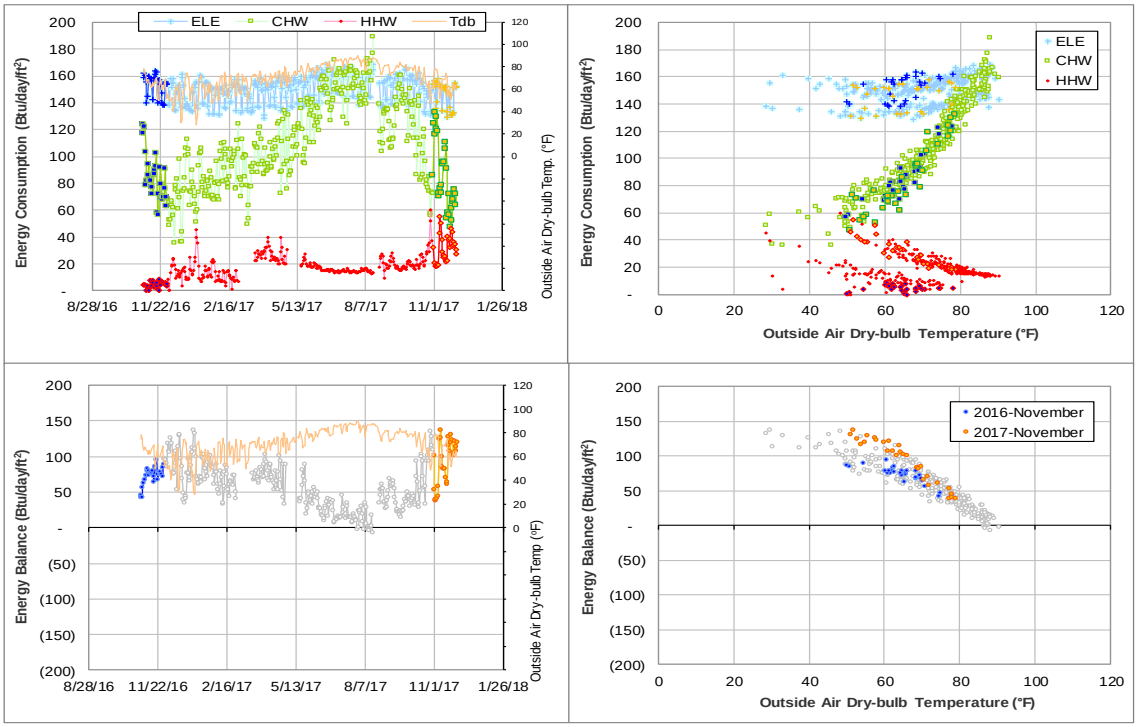
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
Energy Balance	The cross-point is high, around 85°F.	Since data became available in Feb 2015

Comments

The cross-point temperature is high for this building, around 85°F. The daily CHW consumption for last year is 36 – 200 Btu/day/ft^2. The CHW consumption level is low compared to ELE and HHW levels and its ELE has strong dependence on temperature. This building might have its own chillers. A new HHW MID 009829 was discovered on 3/21/2017 and has two or three times the consumption of the older HHW MID 008145, resulting a considerable increase in measured HHW consumption.

Explanatory Figure: 13 months energy balance plot with original data



Offshore Technology Research Center (TAMU Bldg# 1604)

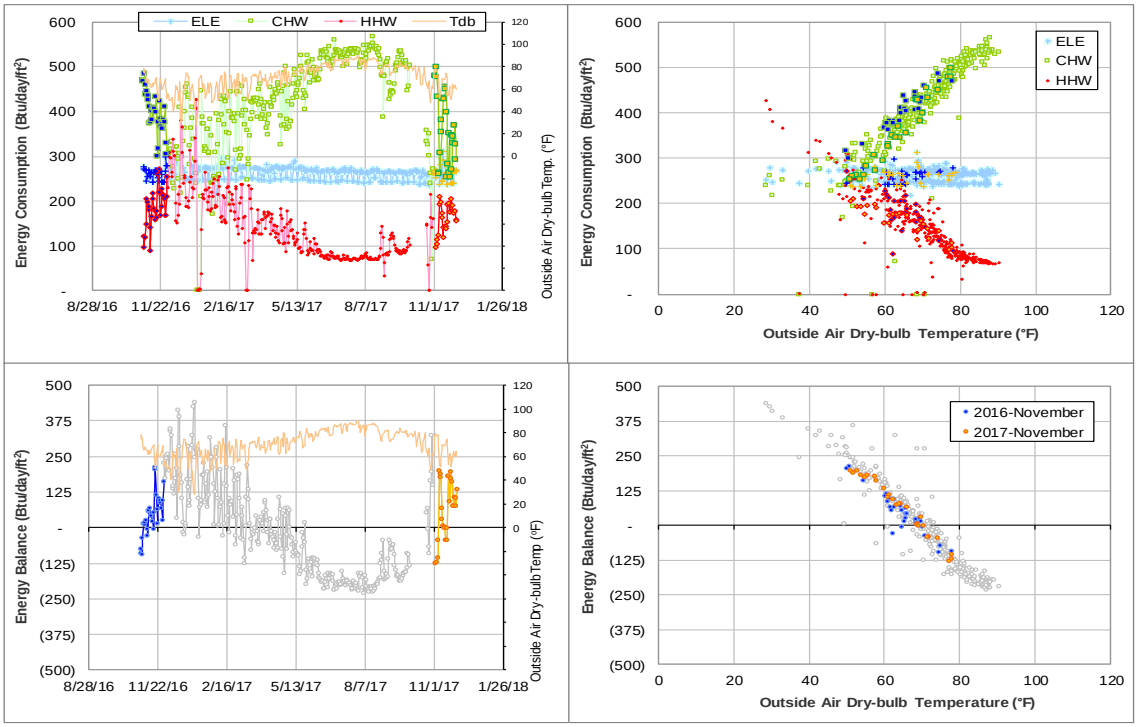
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
ELE MID 006660	Consumption is zero for most of the time.	2/1/2015 – Ongoing

Comments

The electric consumption for MID 006660 has been zero for most of the time since it became available in 2/1/2015. The energy balance of this building has a reasonable pattern. This meter is suspected to measure consumption for a specific piece of equipment that only runs occasionally.

Explanatory Figure: 13 months energy balance plot with original data



Texas A&M Institute for Preclinical Studies A (TAMU Bldg# 1904)

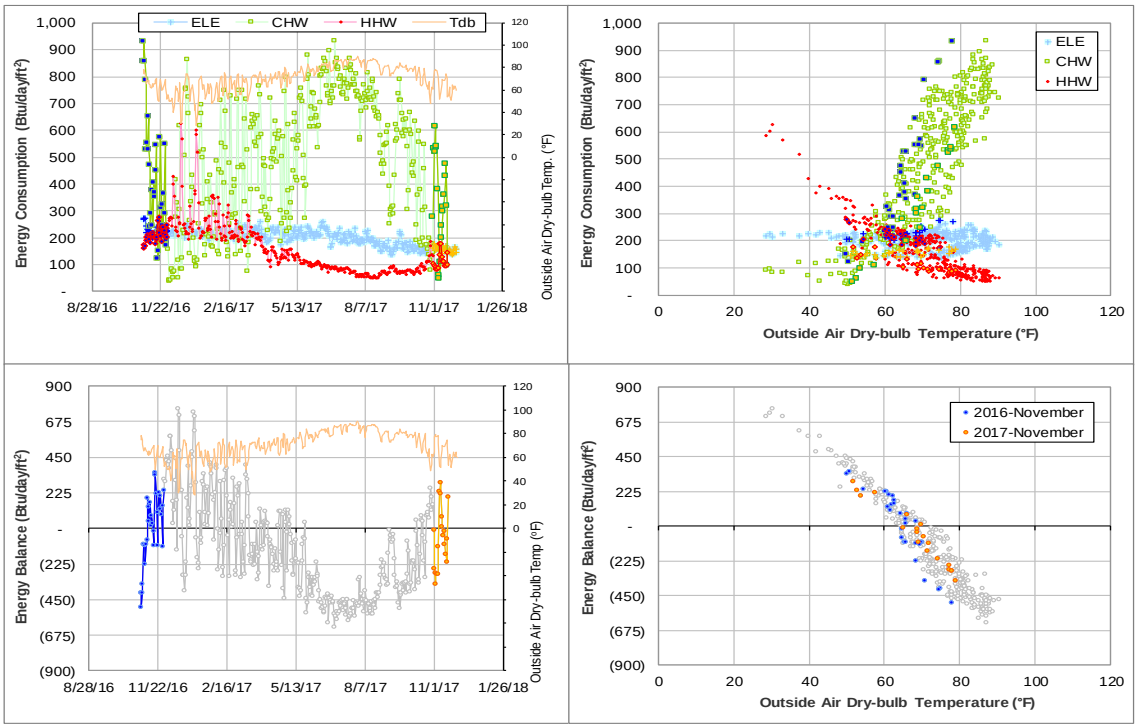
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
ELE, CHW and HHW	Consumption is decreasing gradually.	Since April 2017

Comments

All ELE, CHW, and HHW consumption of this building has decreased since April 2017. Respectively, the three utilities are now about 100 Btu/day/ft^2 (35%), 400 Btu/day/ft^2 (35%), and 100 Btu/day/ft^2 (60%) lower than the same month in the previous year. However, the energy balance maintained the same pattern. Changes may have been made to this building. The decreased consumption level is used for filling.

Explanatory Figure: 13 months energy balance plot with original data



III. Time Series Plots for November 2017 Consumption

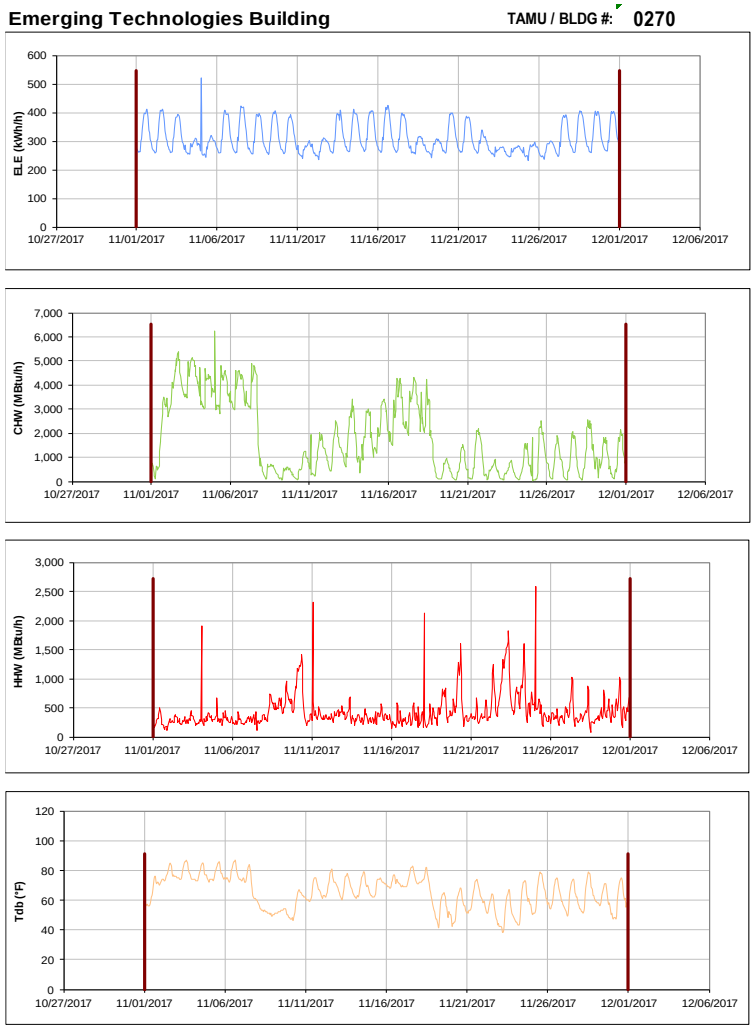


Figure III-1 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Emerging Technologies Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

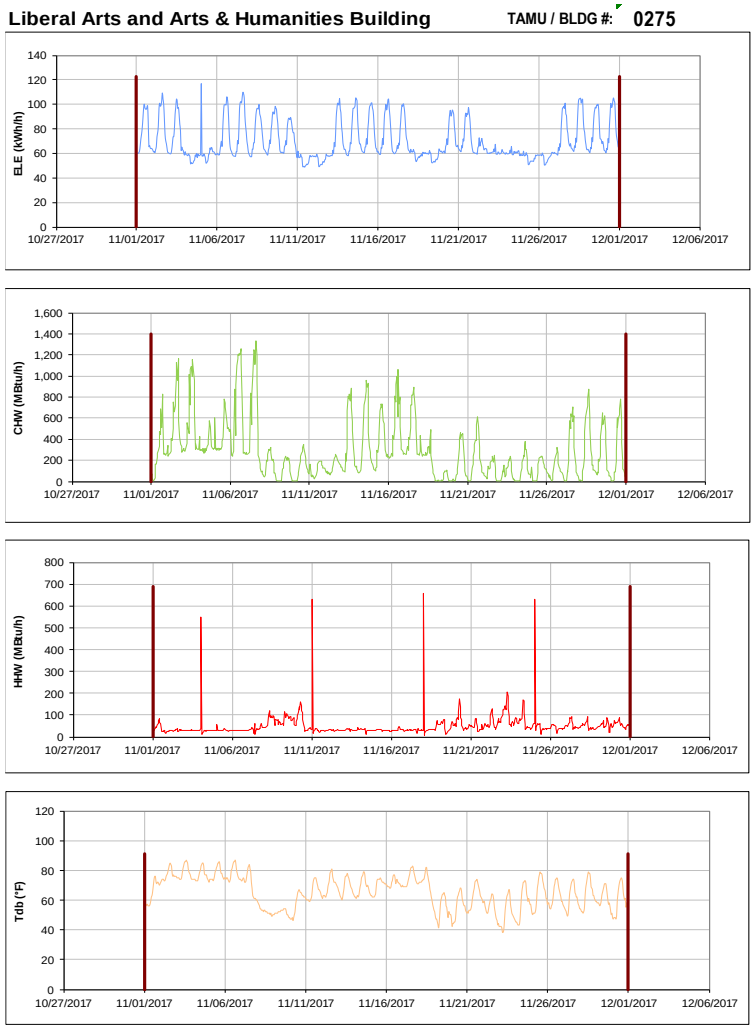


Figure III-2 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Liberal Arts and Arts & Humanities Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

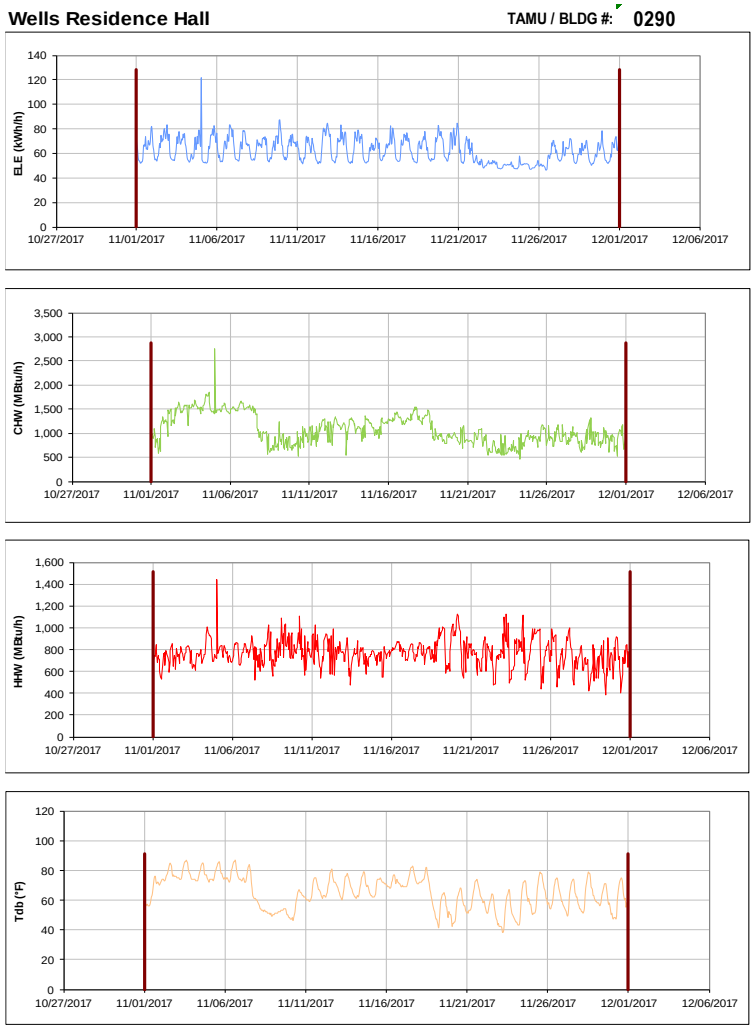


Figure III-3 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Wells Residence Hall during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

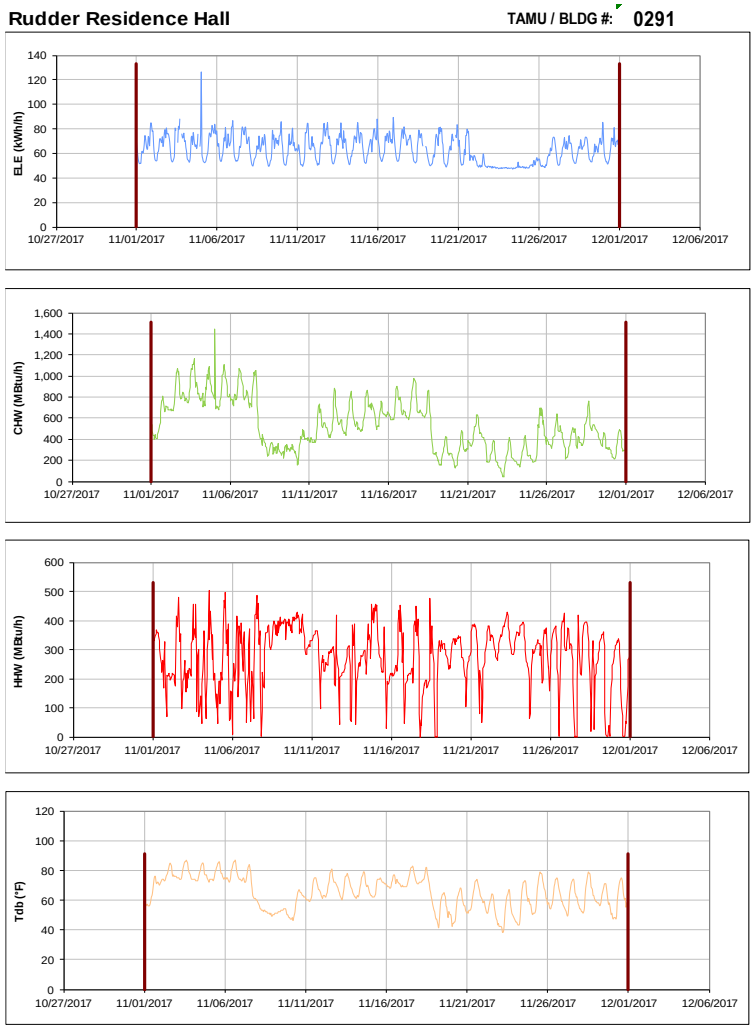


Figure III-4 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Rudder Residence Hall during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

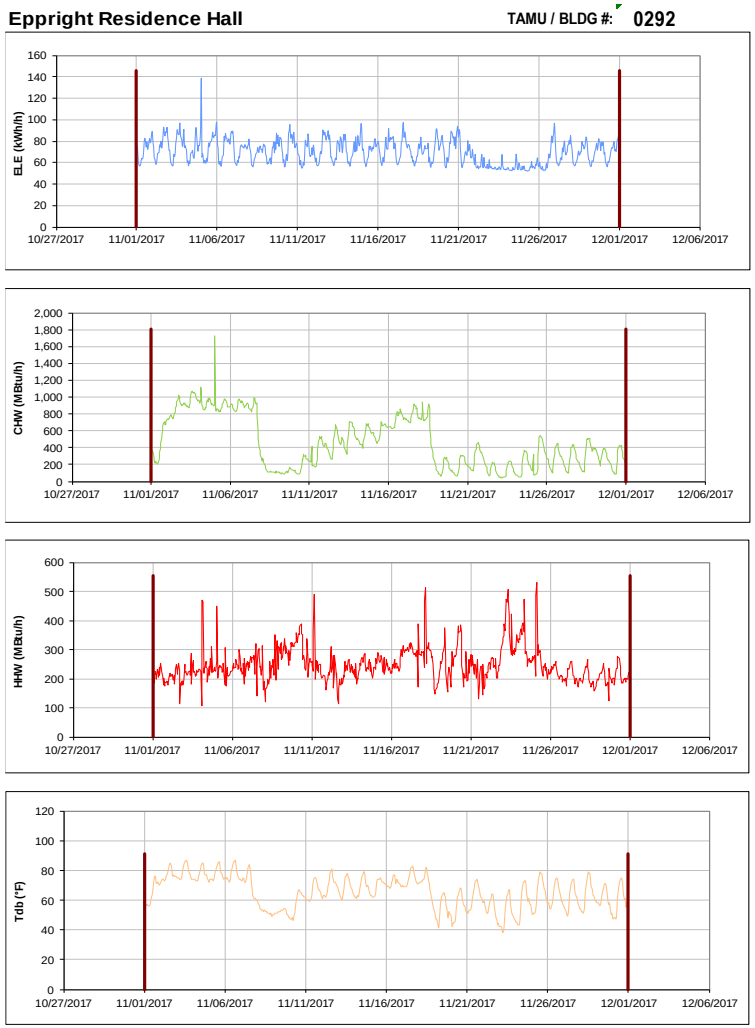


Figure III-5 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Eppright Residence Hall during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

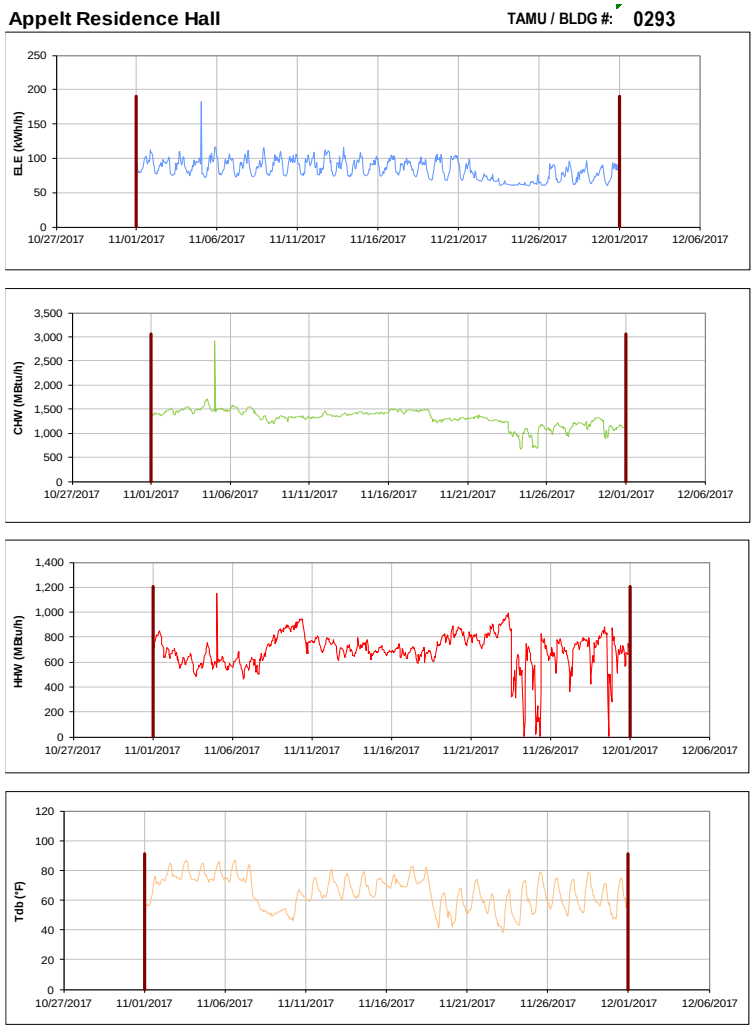


Figure III-6 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Appelt Residence Hall during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

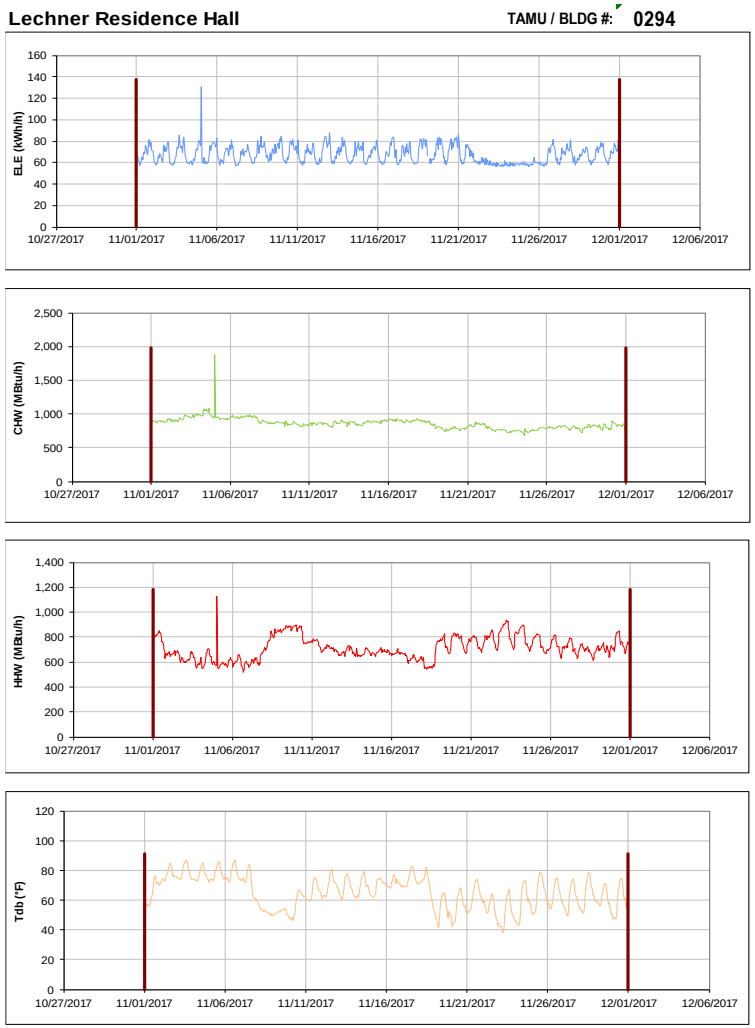


Figure III-7 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Lechner Residence Hall during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

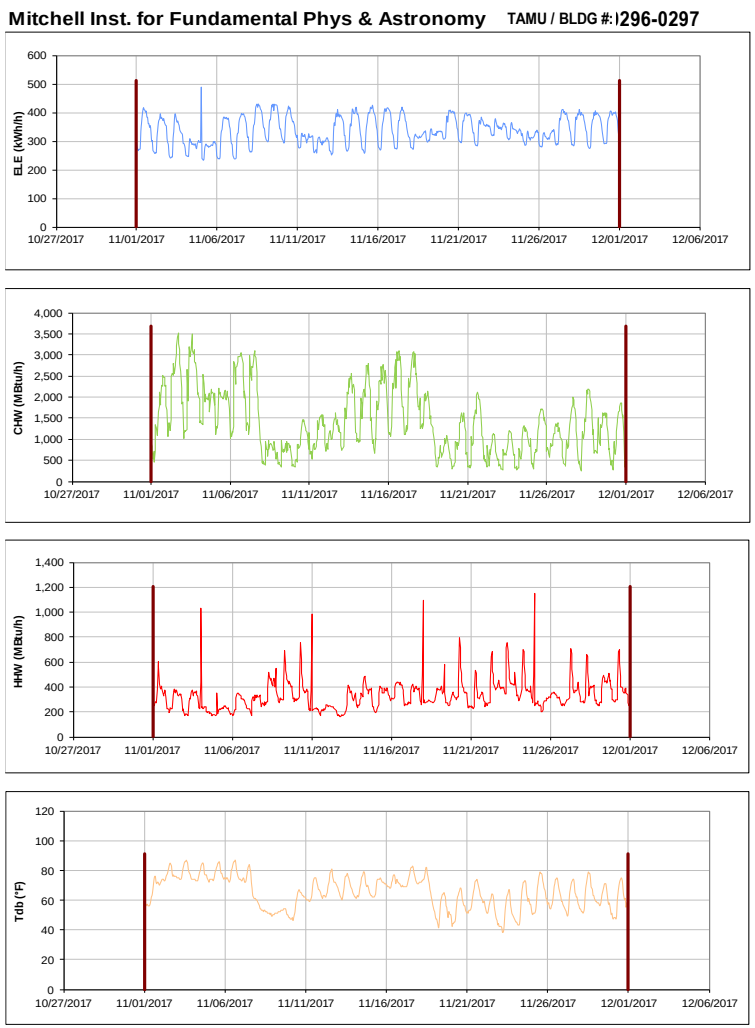


Figure III-8 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Mitchell Inst. for Fundamental Phys & Astronomy during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

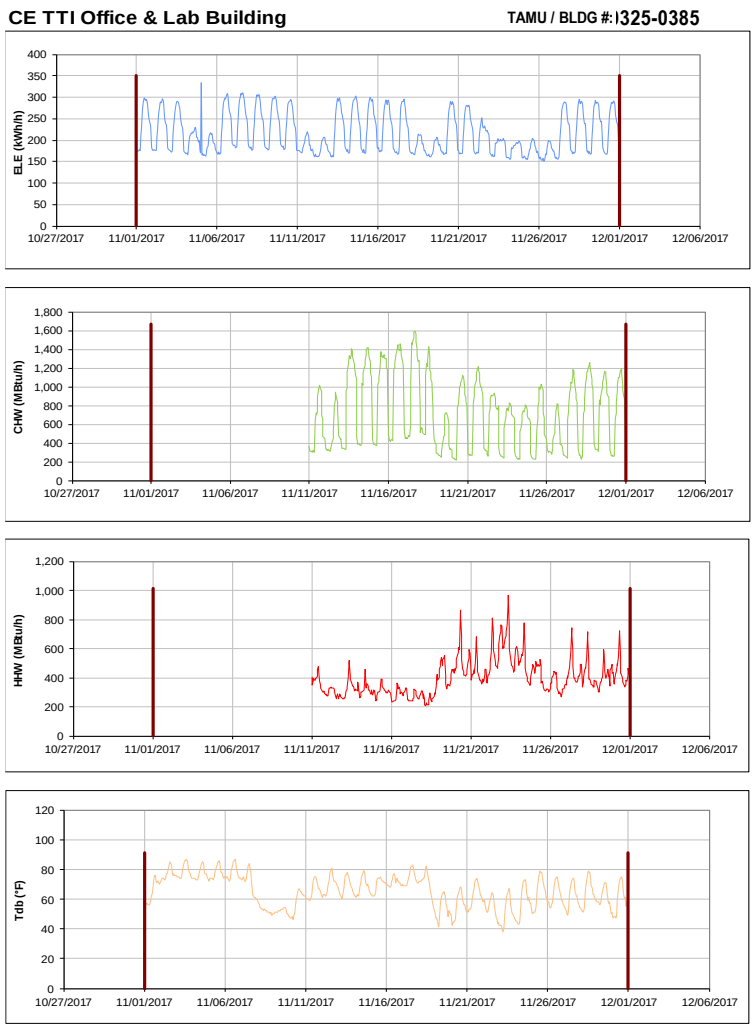


Figure III-9 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for CE TTI Office & Lab Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

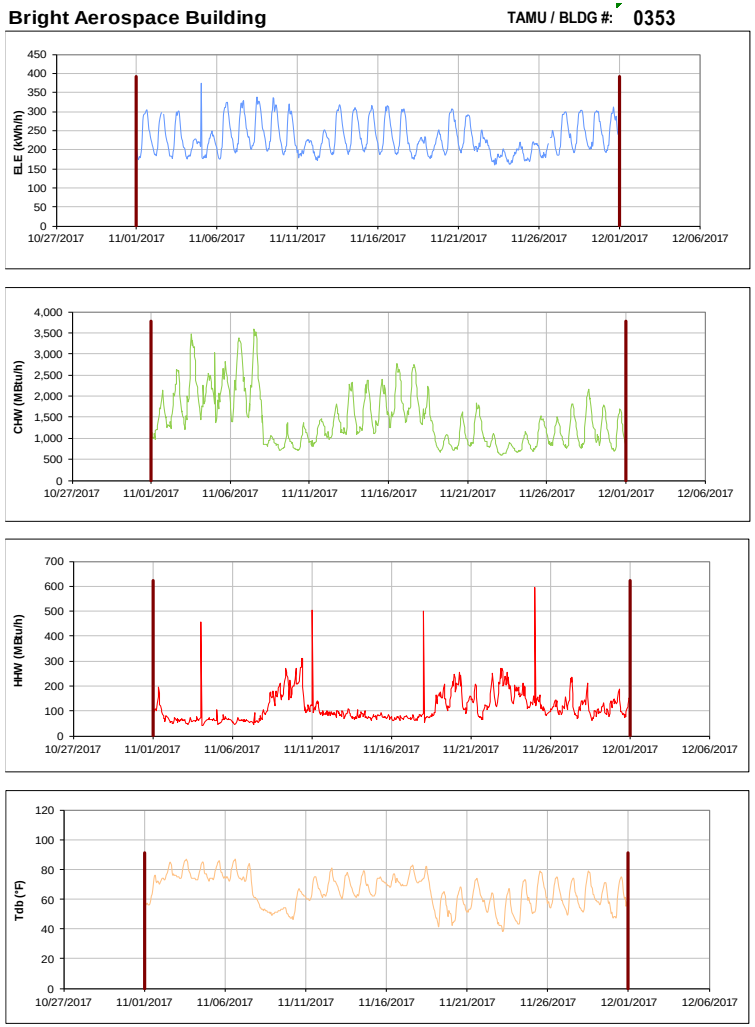


Figure III-10 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Bright Aerospace Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

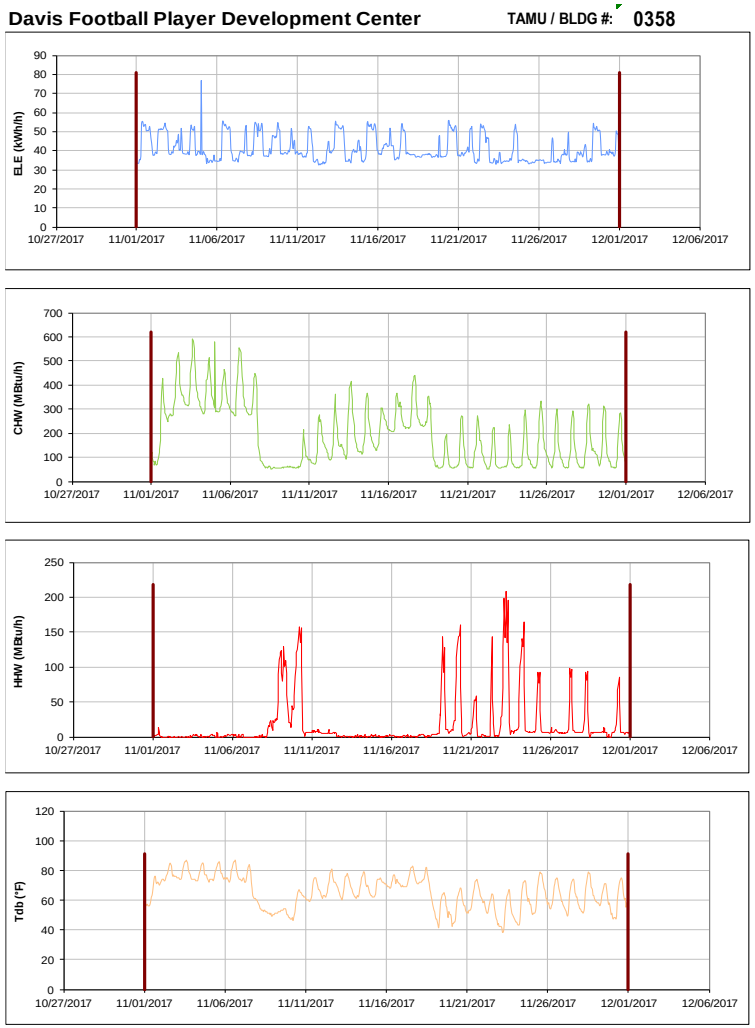


Figure III-11 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Davis Football Player Development Center during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

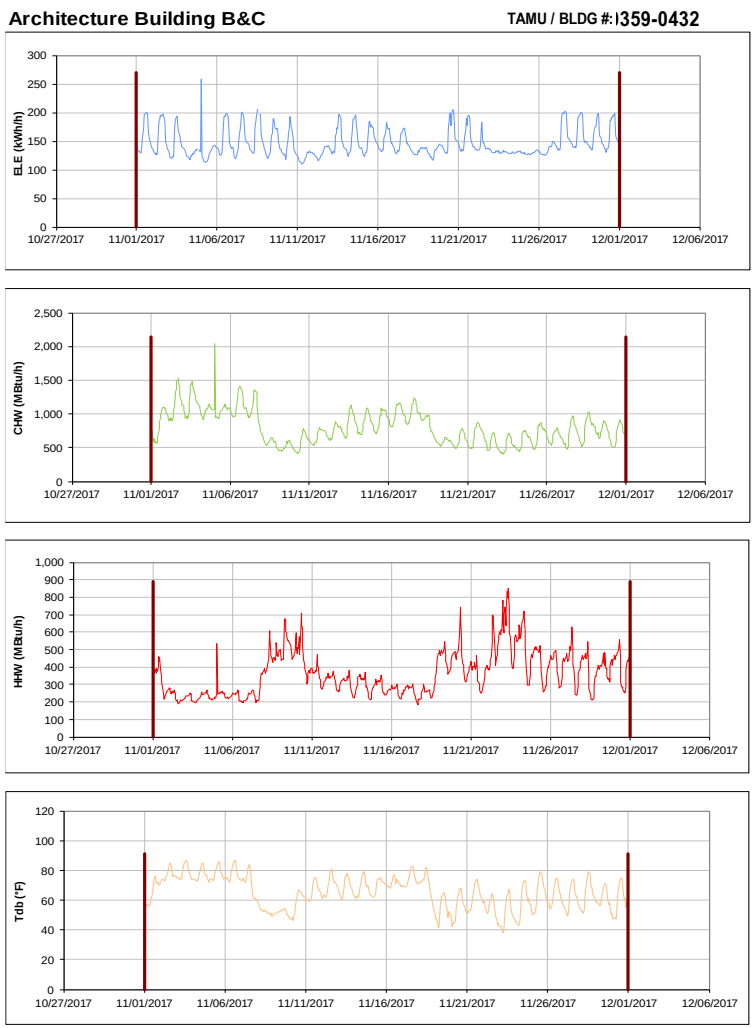


Figure III-12 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Architecture Building B&C during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

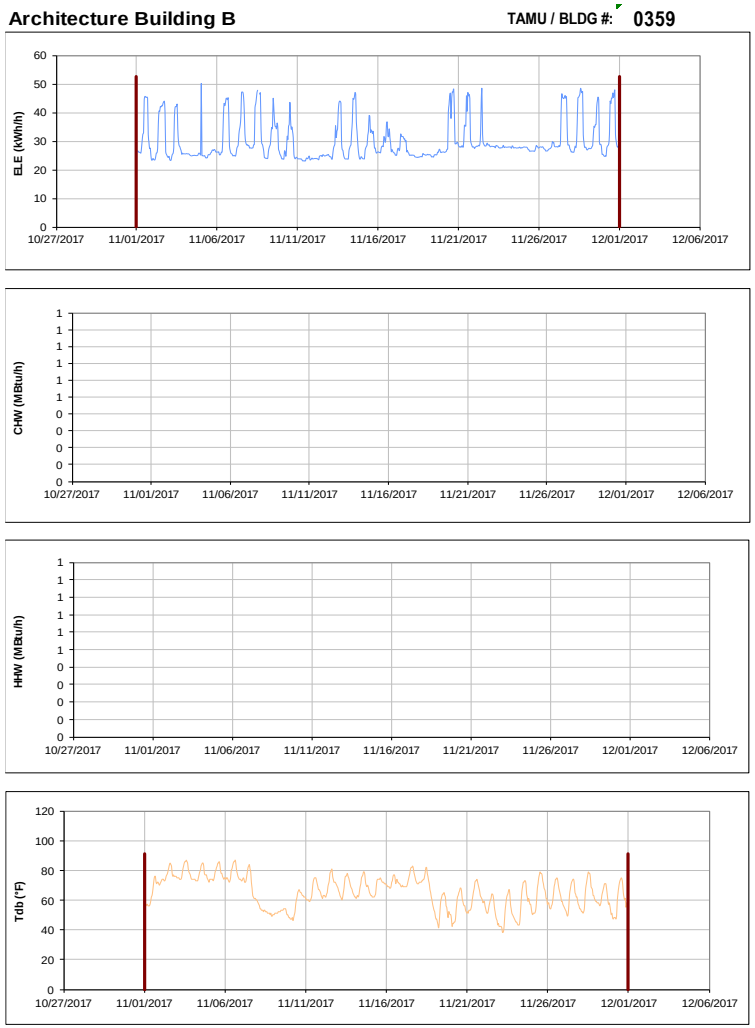


Figure III-13 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Architecture Building B during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

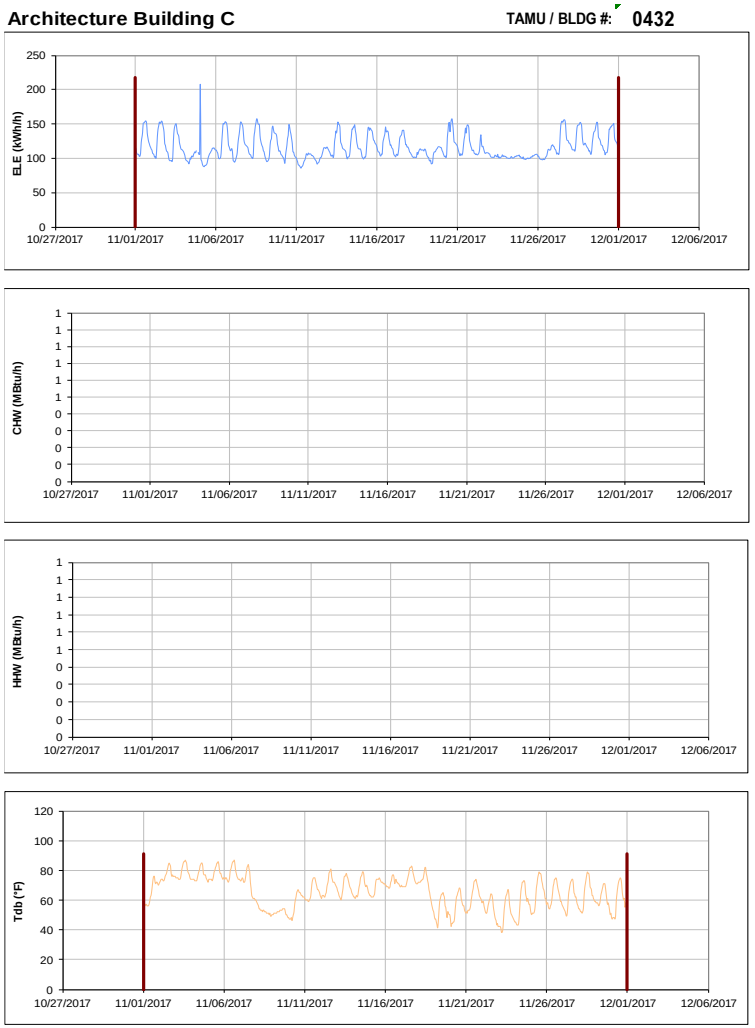


Figure III-14 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Architecture Building C during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

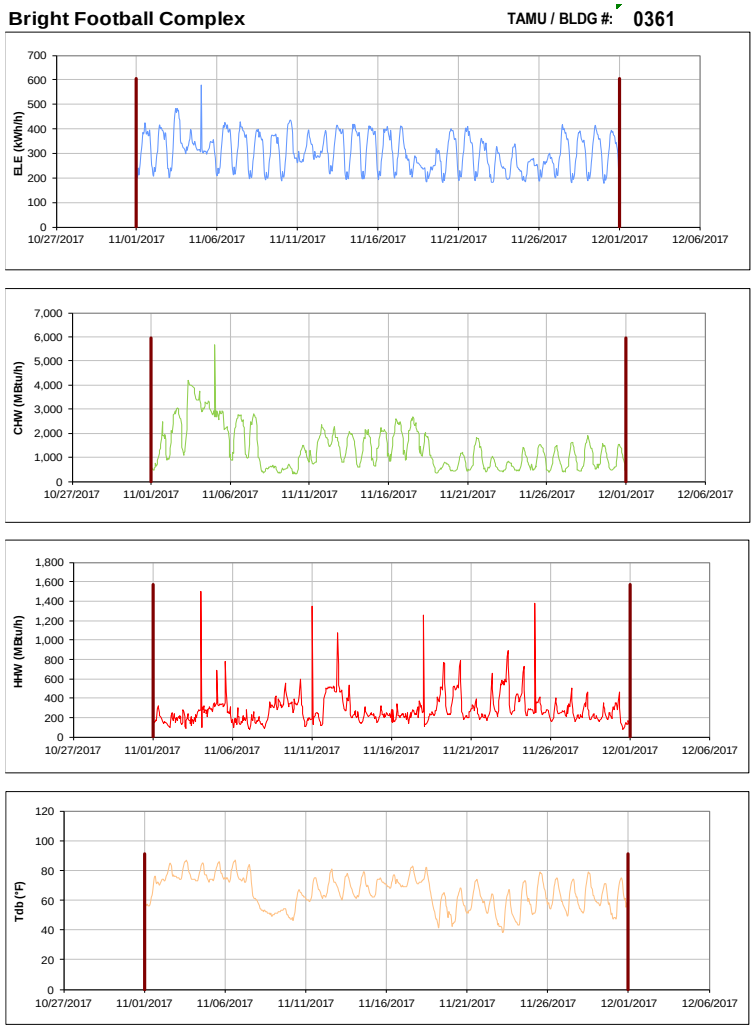


Figure III-15 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Bright Football Complex during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-16 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Kyle Field during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-17 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Chemistry Building Addition during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-18 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Koldus Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

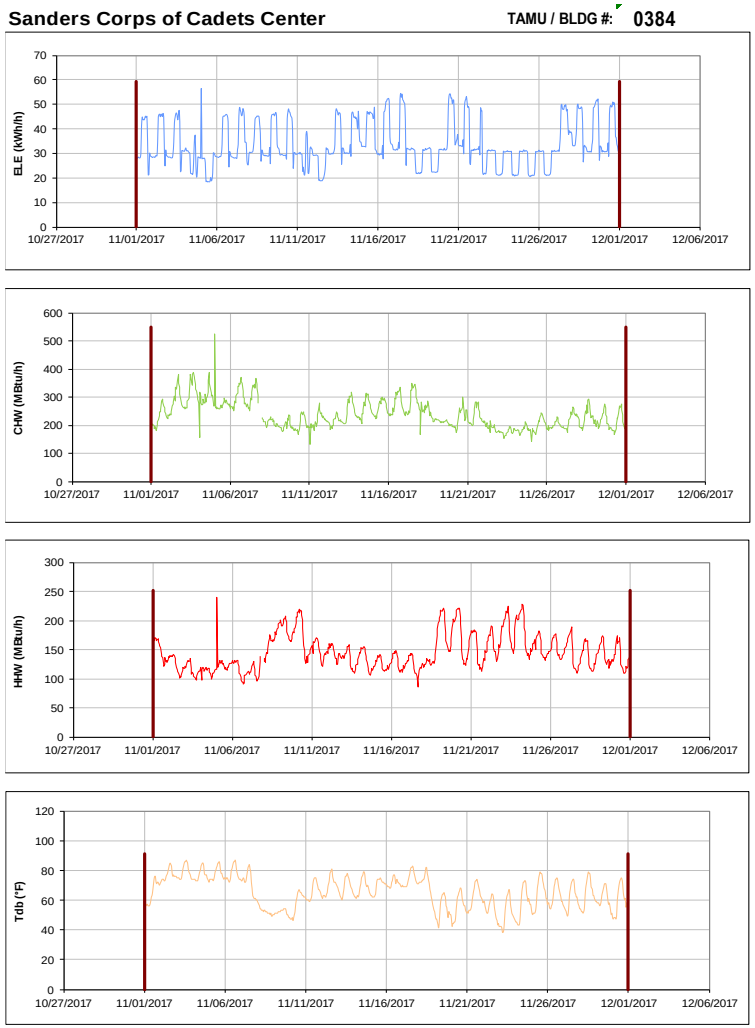


Figure III-19 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Sanders Corps of Cadets Center during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

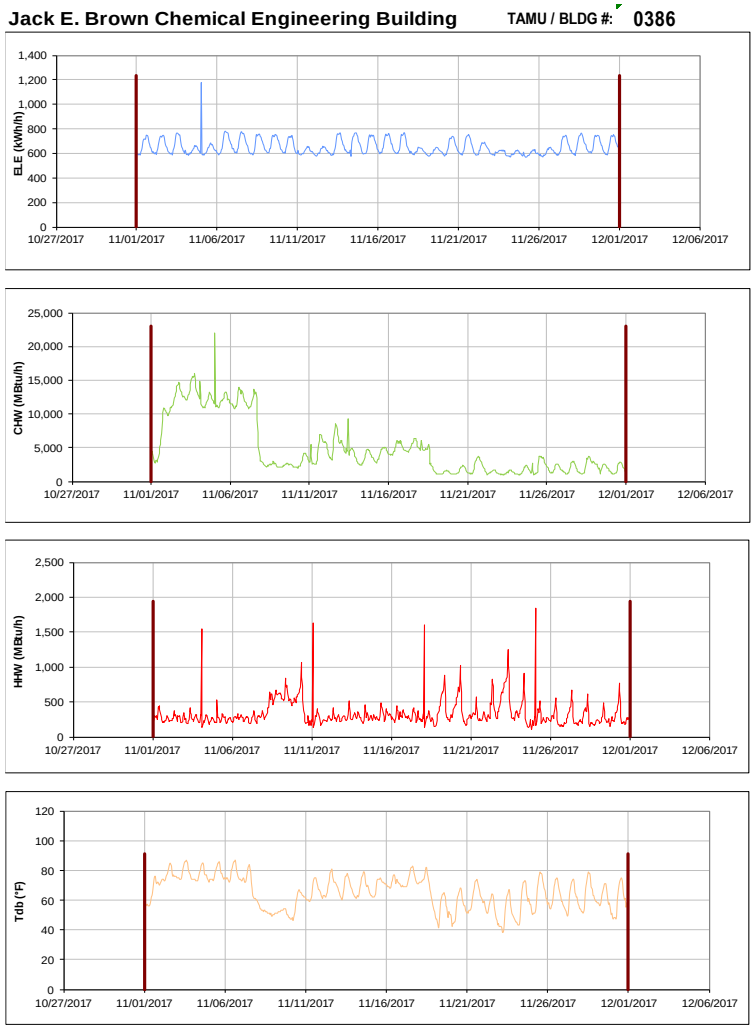


Figure III-20 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Jack E. Brown Chemical Engineering Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-21 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Richardson Petroleum Engineering Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

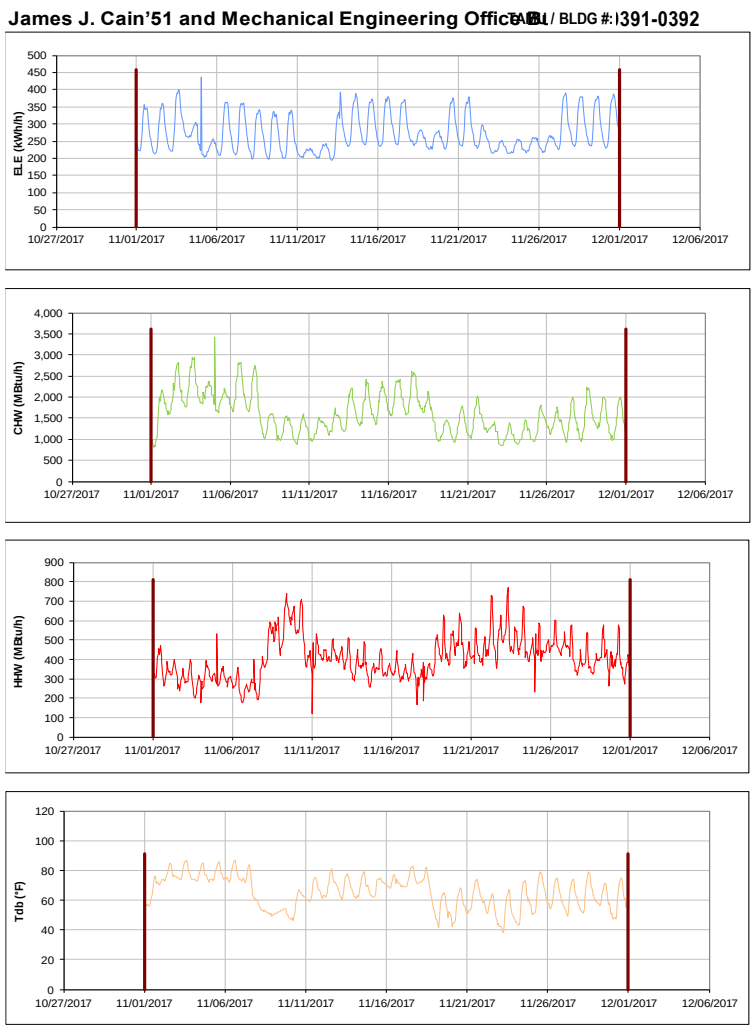


Figure III-22 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for James J. Cain'51 and Mechanical Engineering Office Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station,

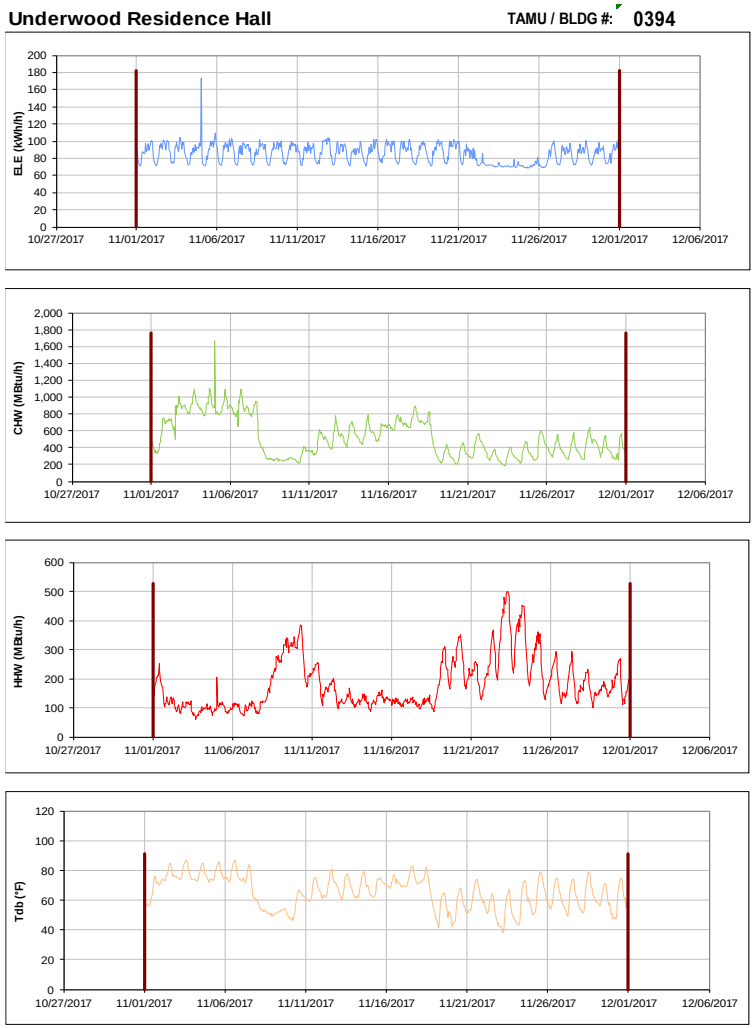


Figure III-23 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Underwood Residence Hall during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

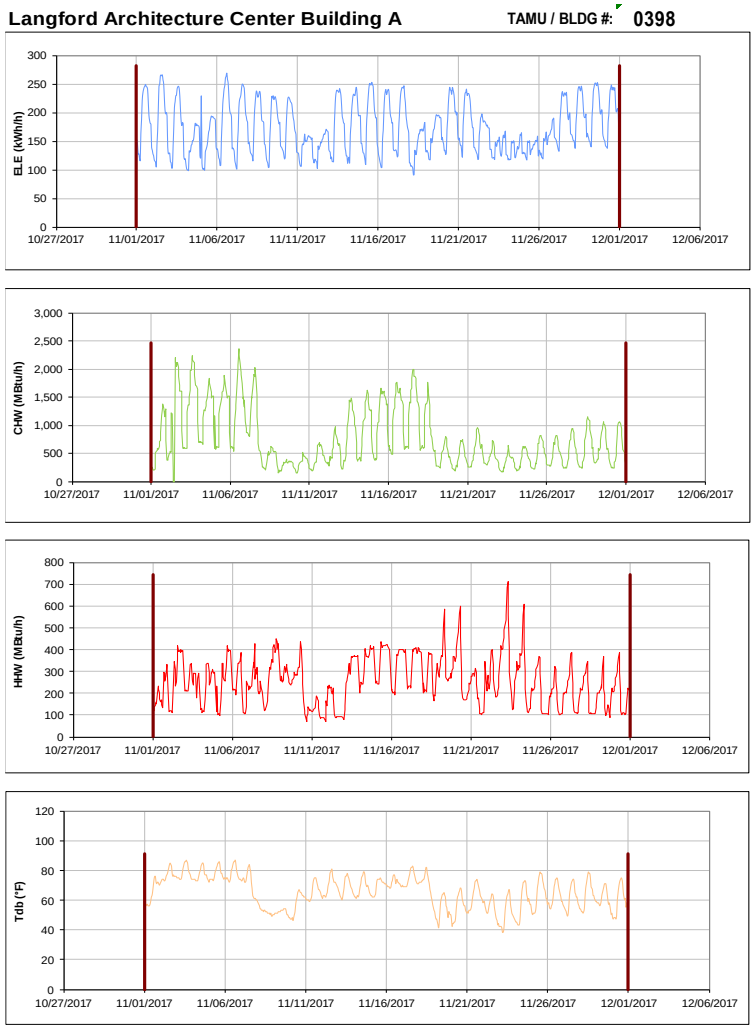


Figure III-24 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Langford Architecture Center Building A during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

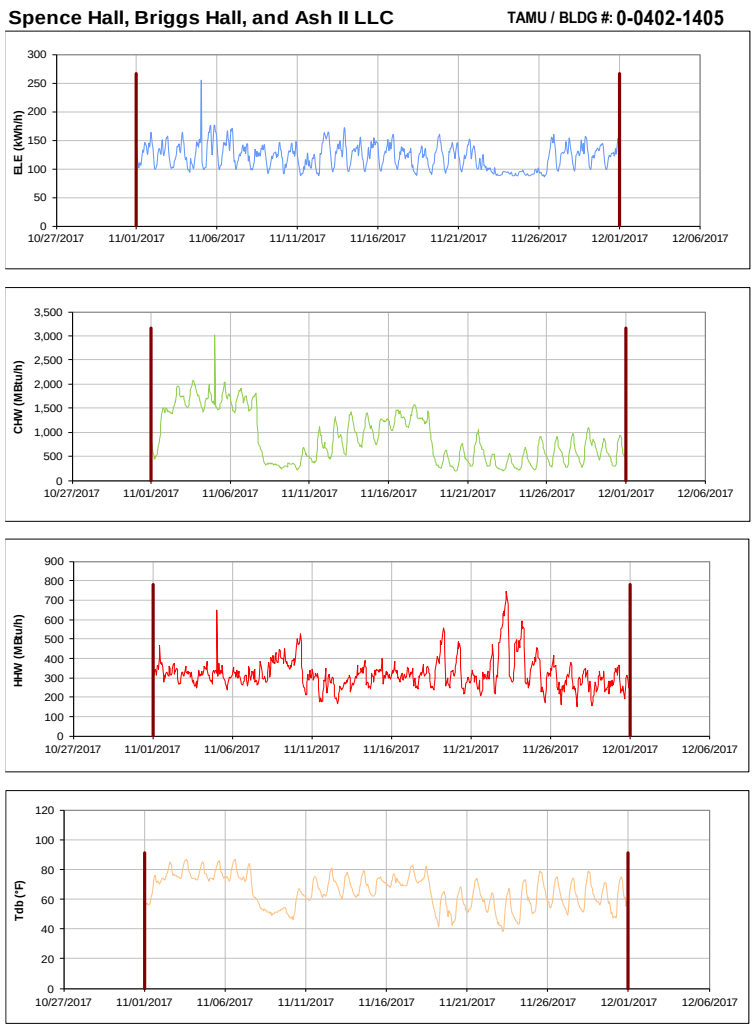


Figure III-25 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Spence Hall, Briggs Hall, and Ash II LLC during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

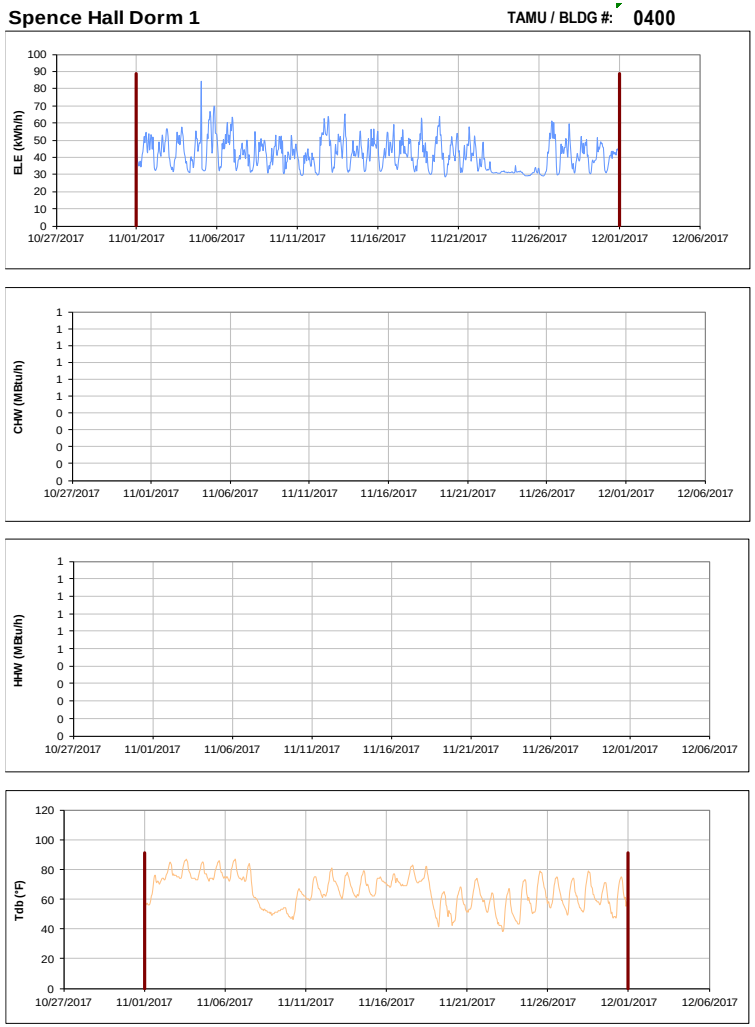


Figure III-26 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Spence Hall Dorm 1 during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

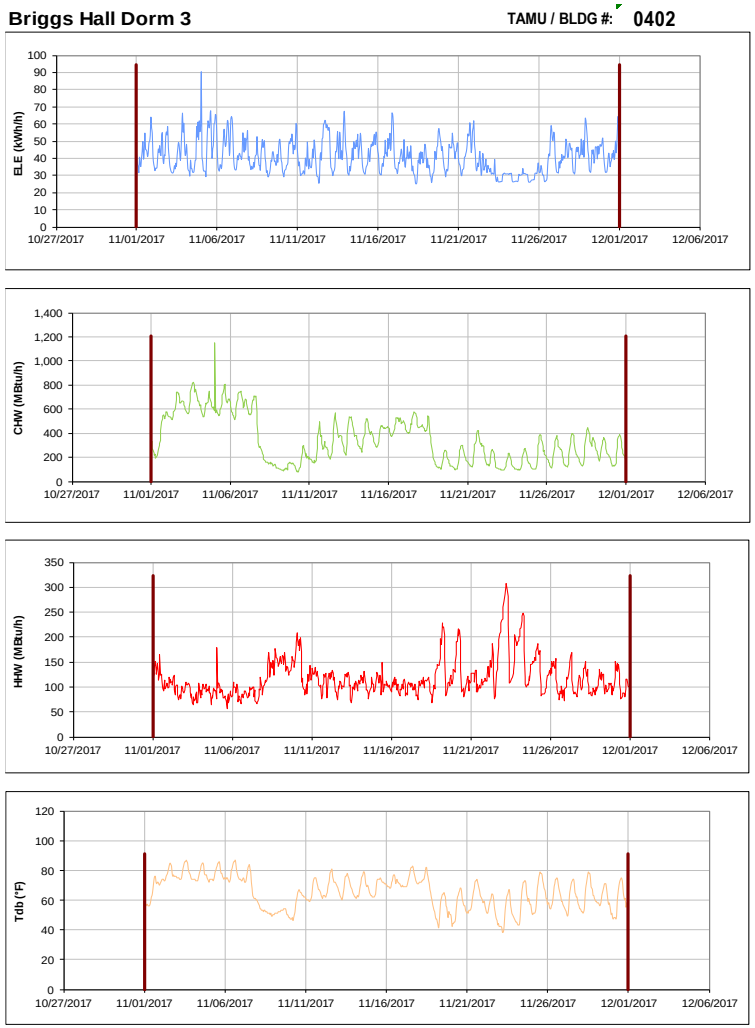


Figure III-27 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Briggs Hall Dorm 3 during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

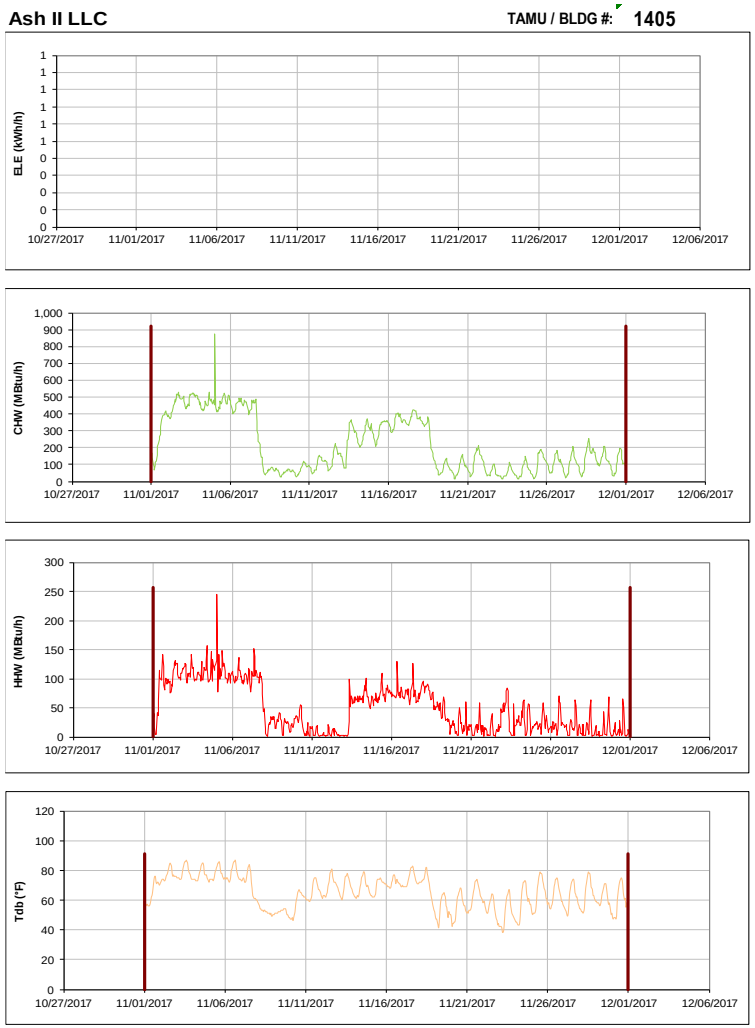


Figure III-28 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Ash II LLC during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

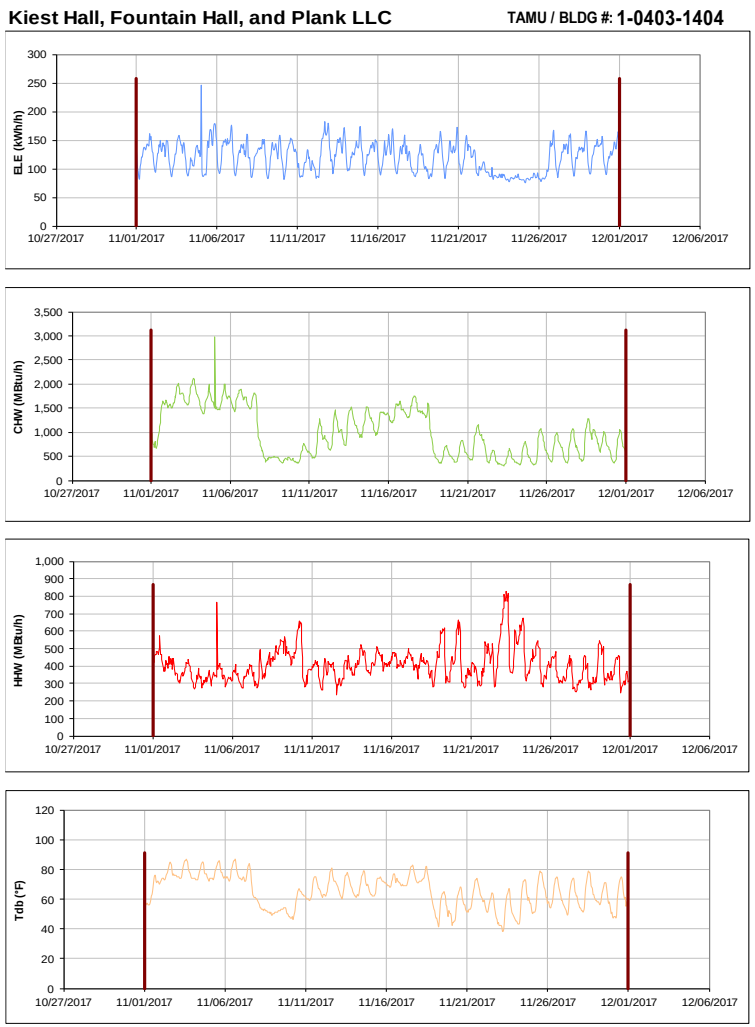


Figure III-29 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Kiest Hall, Fountain Hall, and Plank LLC during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

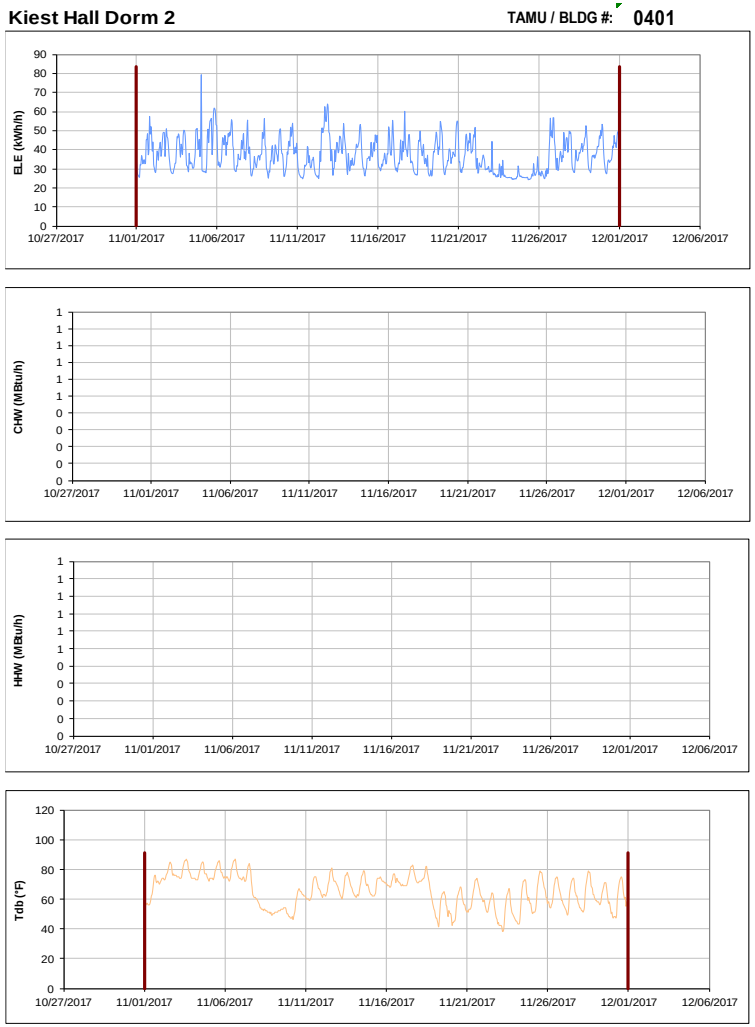


Figure III-30 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Kiest Hall Dorm 2 during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

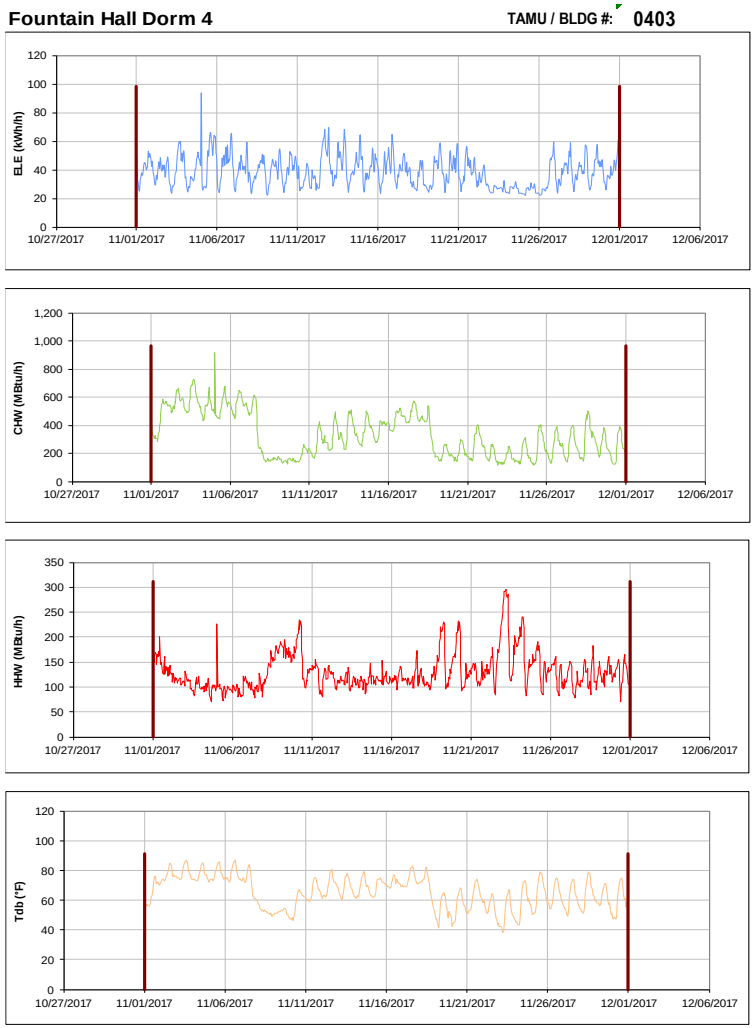


Figure III-31 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Fountain Hall Dorm 4 during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

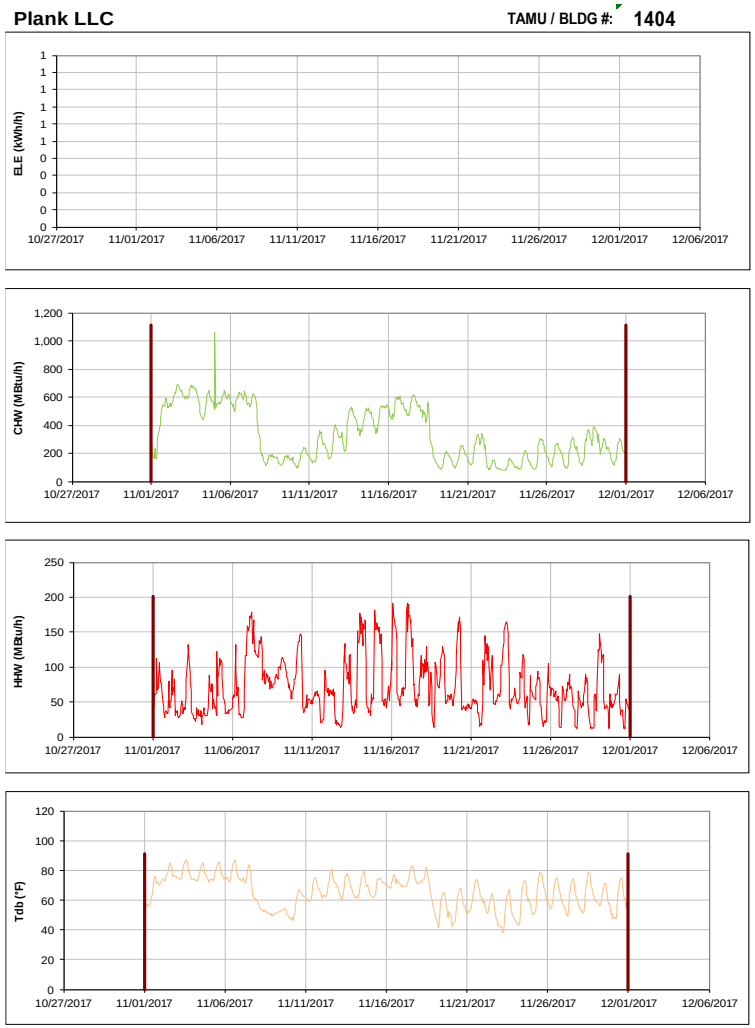


Figure III-32 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Plank LLC during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

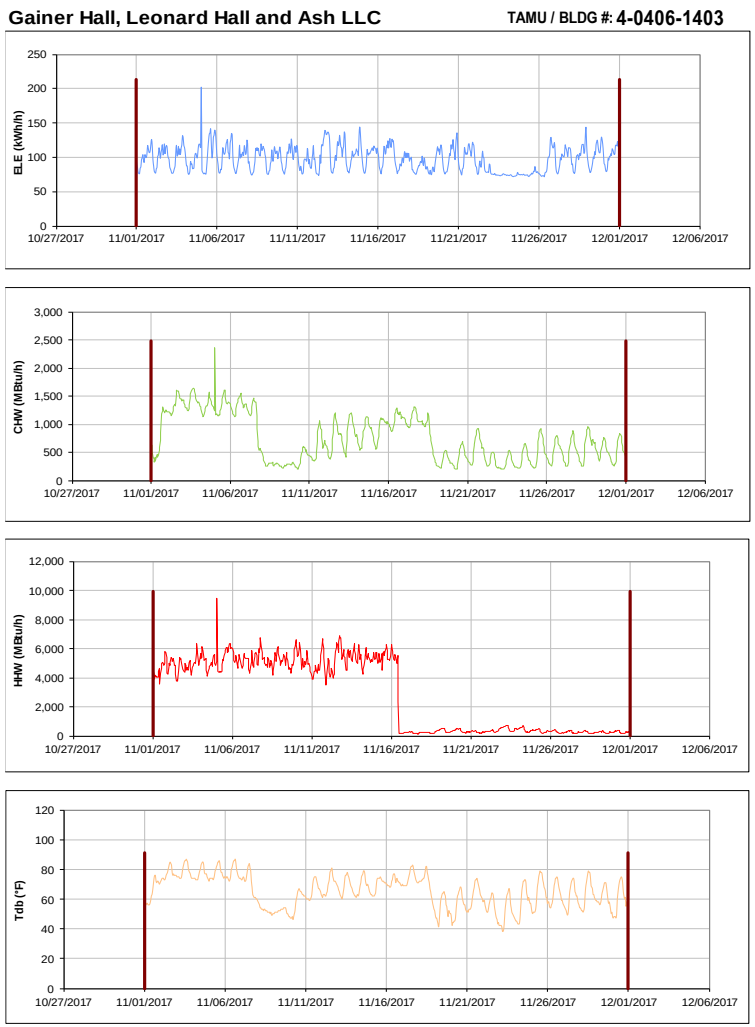


Figure III-33 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Gainer Hall, Leonard Hall and Ash LLC during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

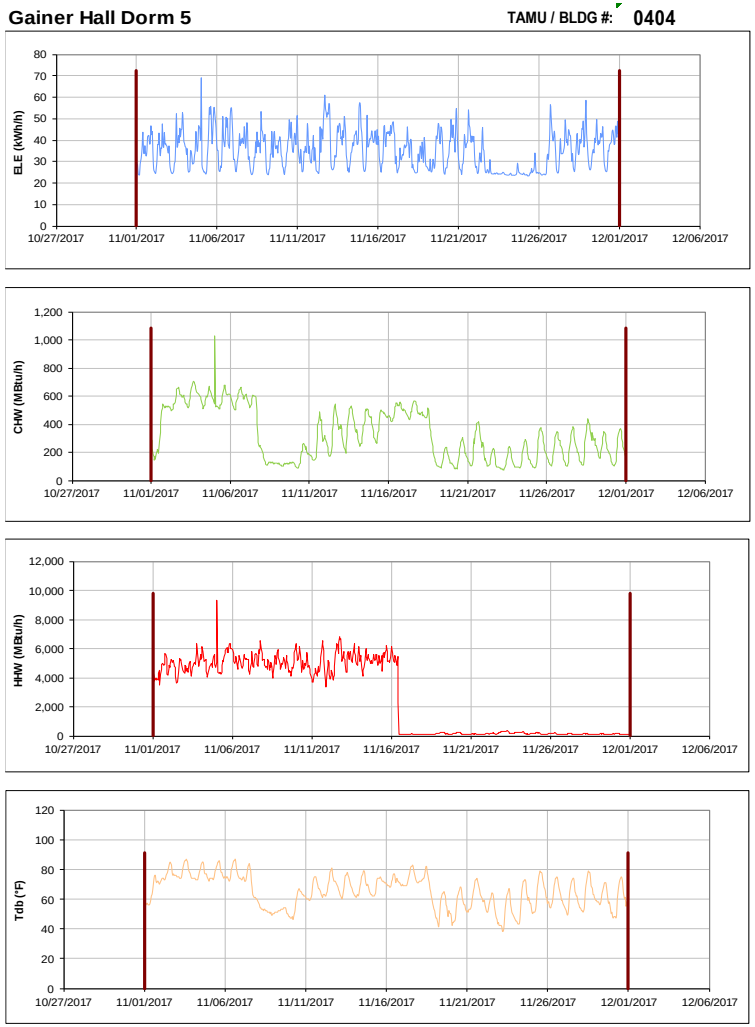


Figure III-34 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Gainer Hall Dorm 5 during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

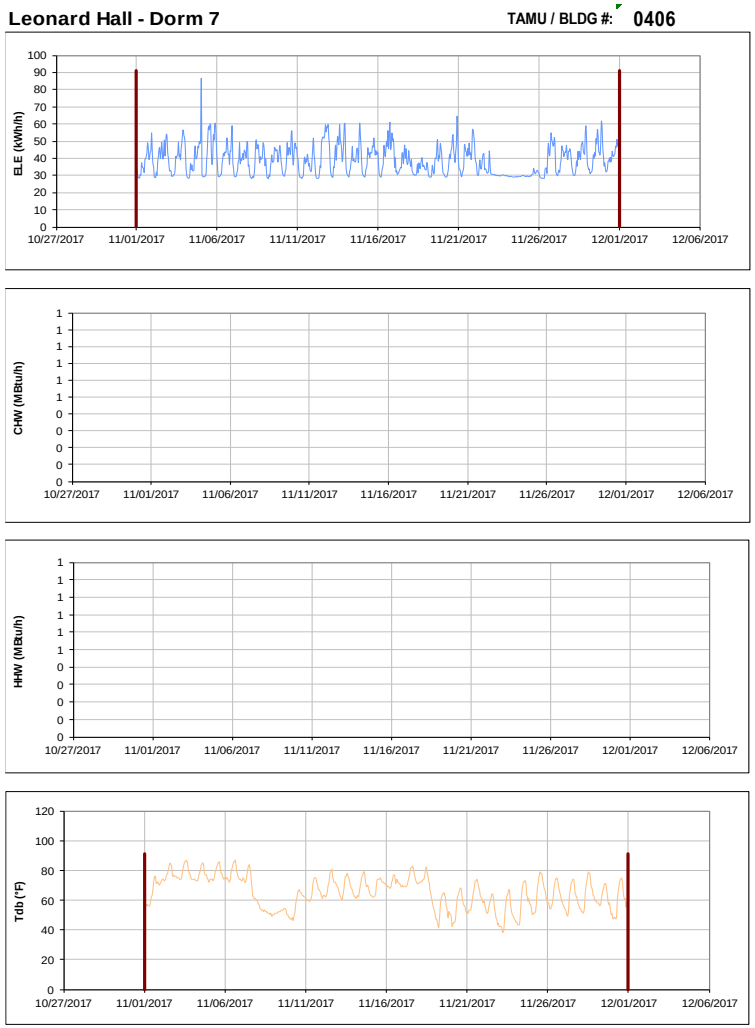


Figure III-35 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Leonard Hall - Dorm 7 during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

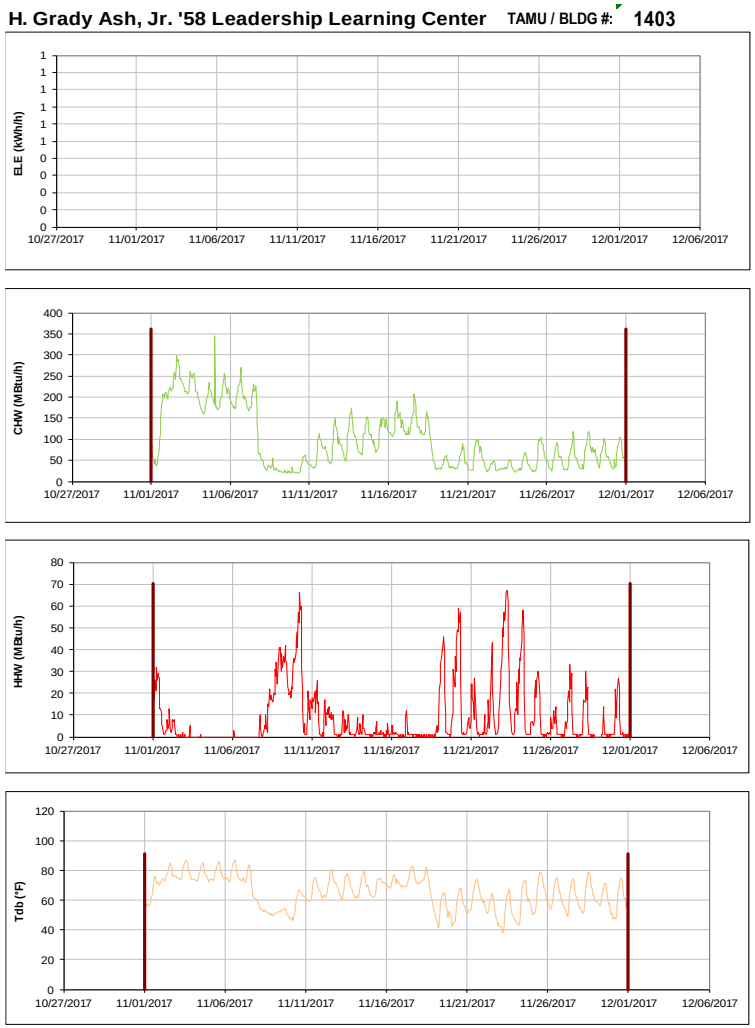


Figure III-36 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for H. Grady Ash, Jr. '58 Leadership Learning Center during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

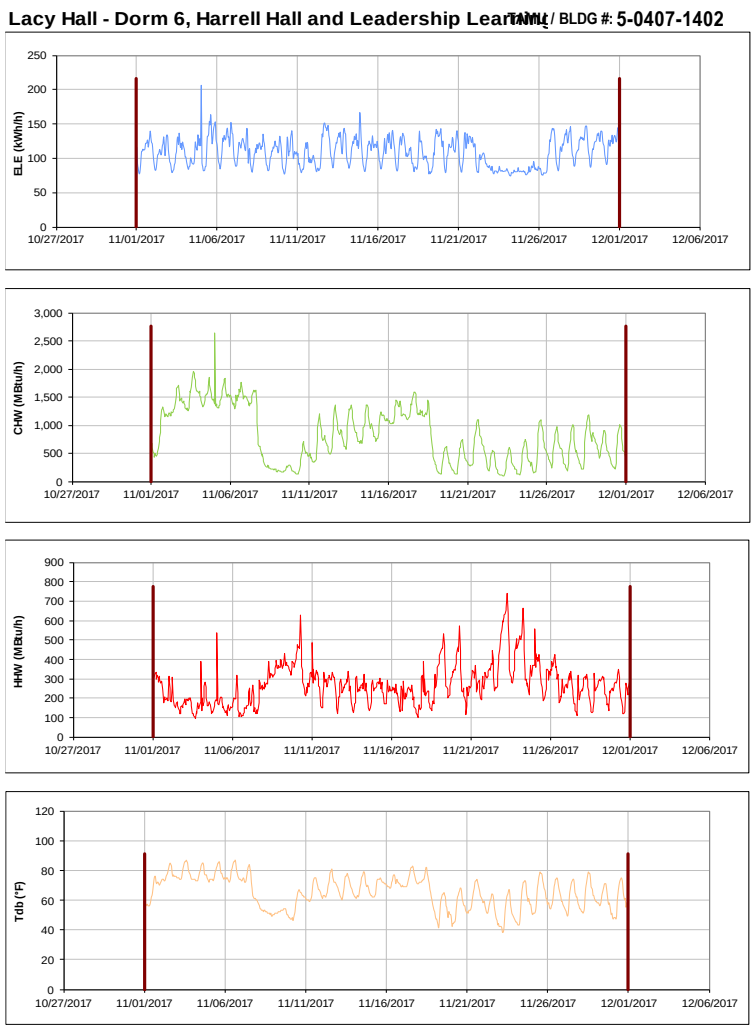


Figure III-37 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Lacy Hall - Dorm 6, Harrell Hall and Leadership Learning Center during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

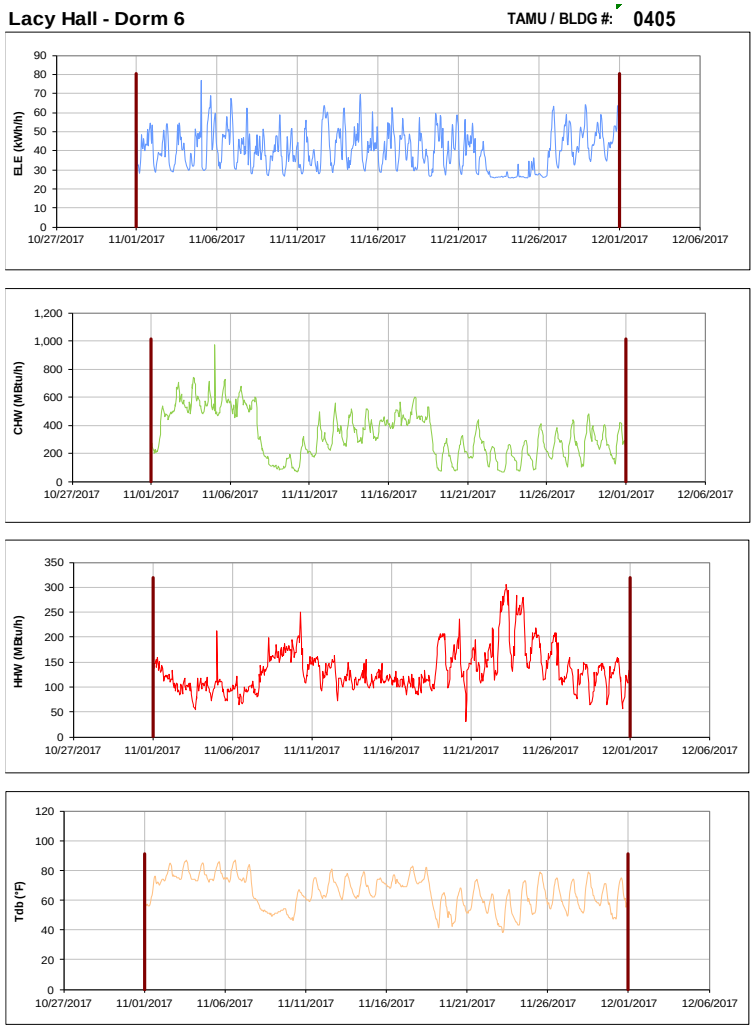


Figure III-38 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Lacy Hall - Dorm 6 during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

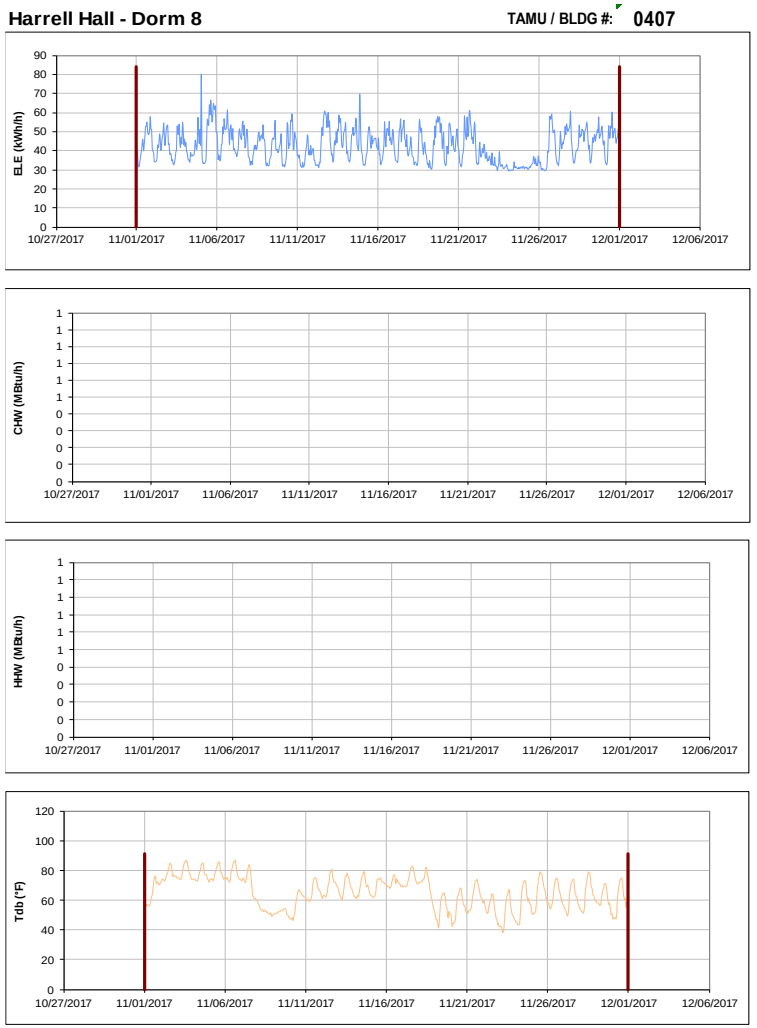


Figure III-39 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Harrell Hall - Dorm 8 during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-40 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Buzbee Leadership Learning Center during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

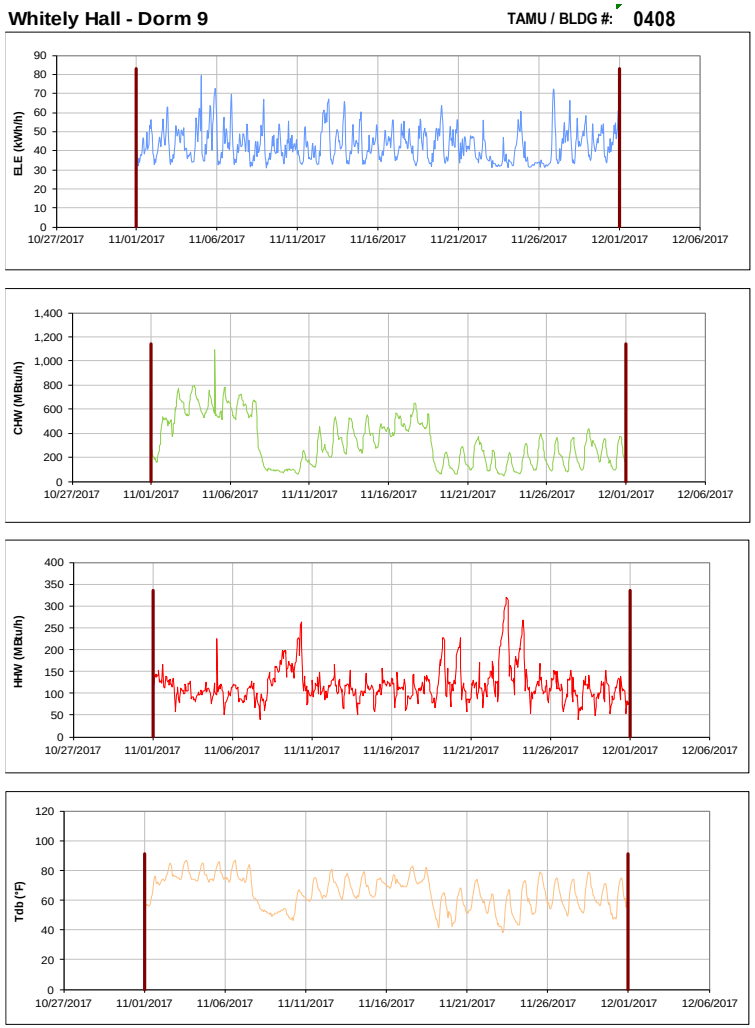


Figure III-41 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Whitely Hall - Dorm 9 during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

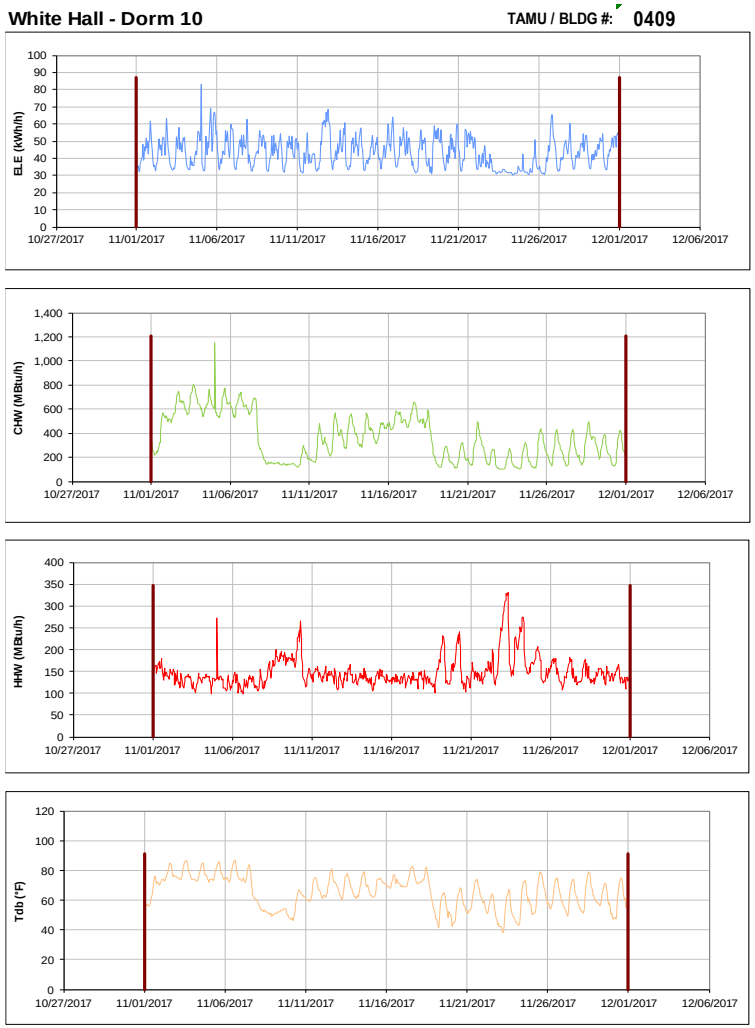


Figure III-42 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for White Hall - Dorm 10 during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

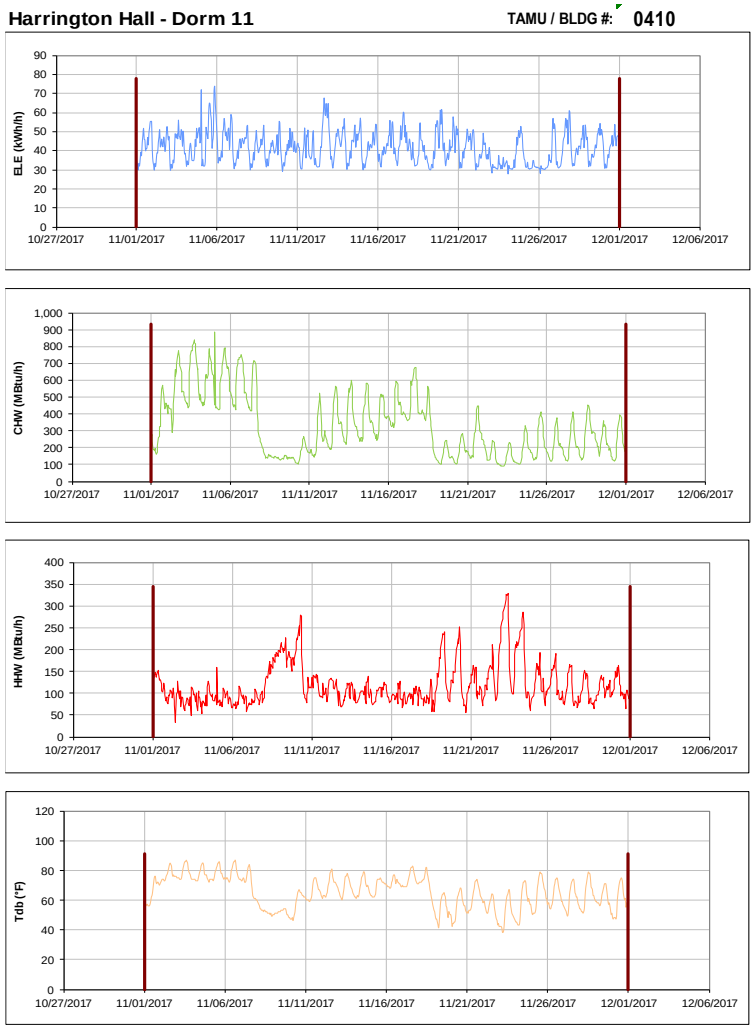


Figure III-43 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Harrington Hall - Dorm 11 during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

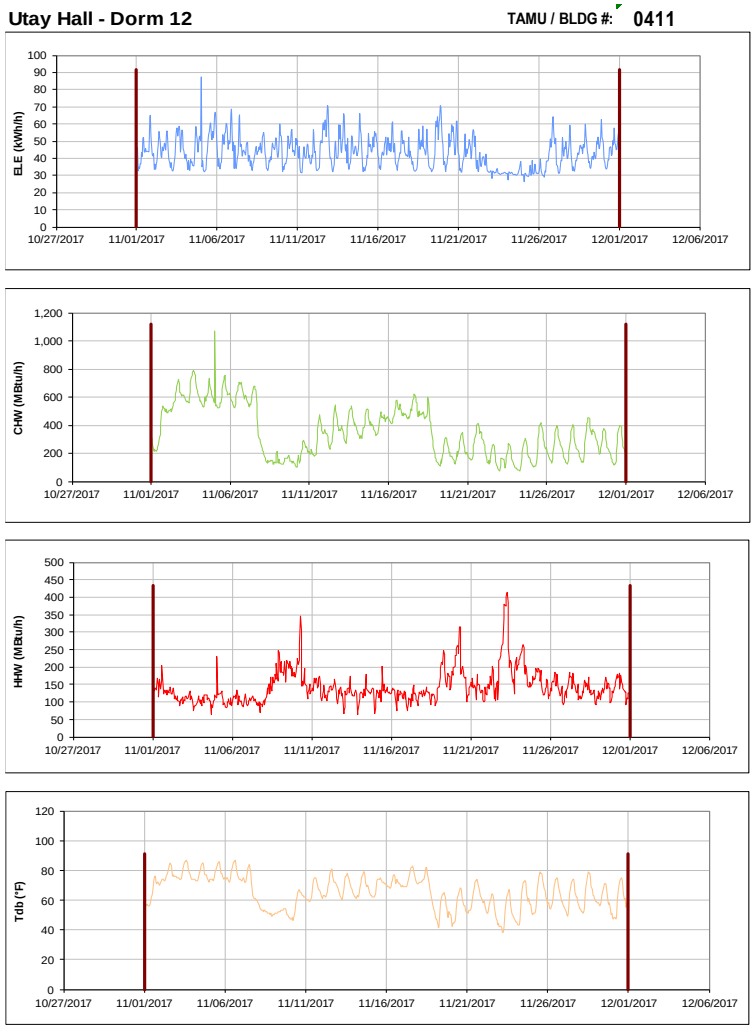


Figure III-44 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Utay Hall - Dorm 12 during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

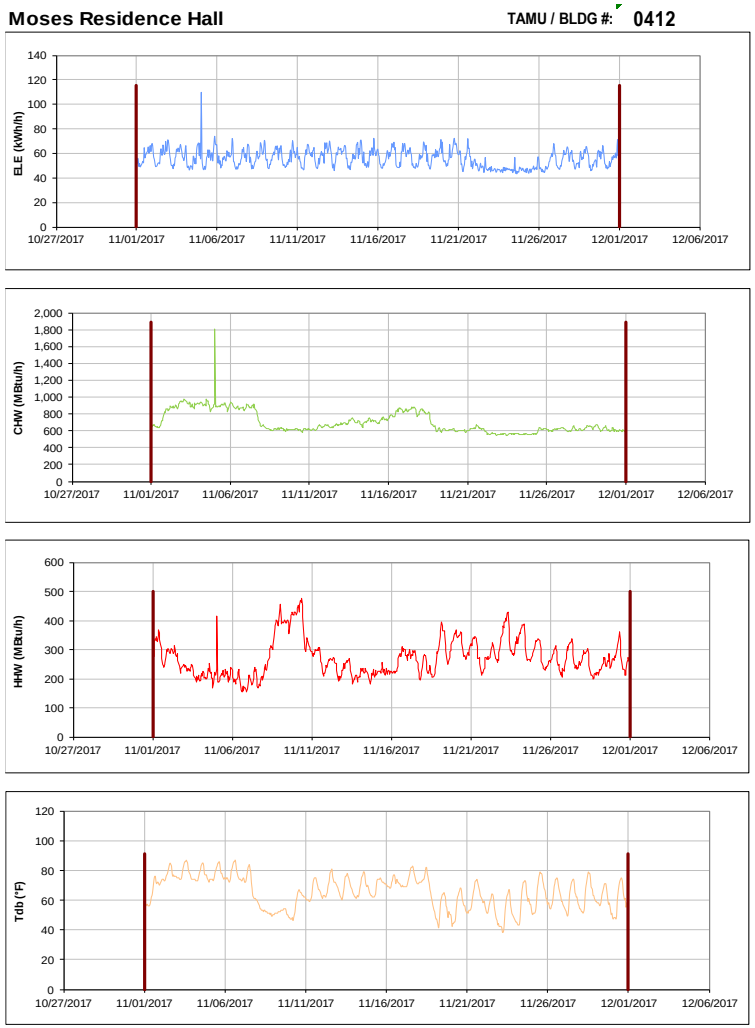


Figure III-45 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Moses Residence Hall during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

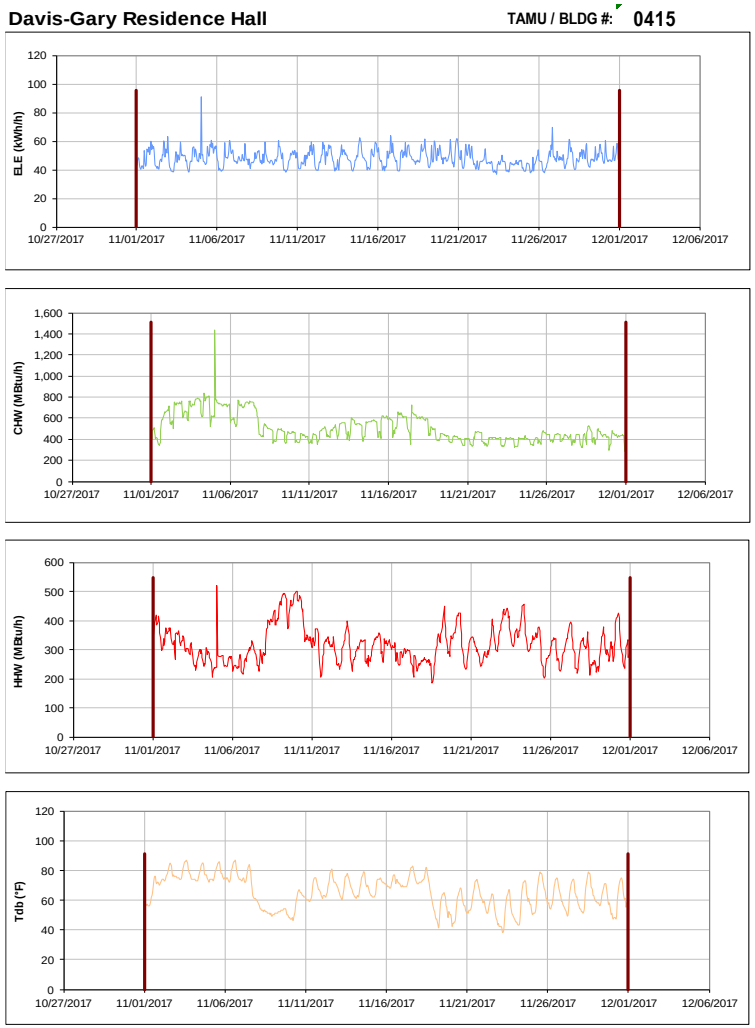


Figure III-46 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Davis-Gary Residence Hall during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

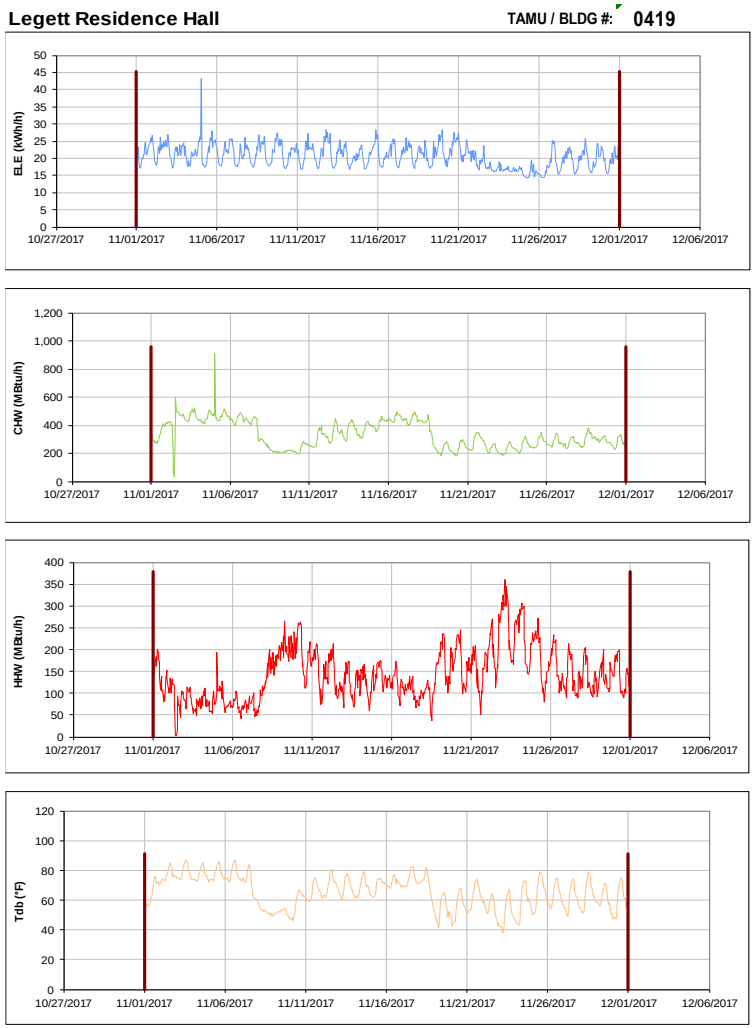


Figure III-47 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Legett Residence Hall during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

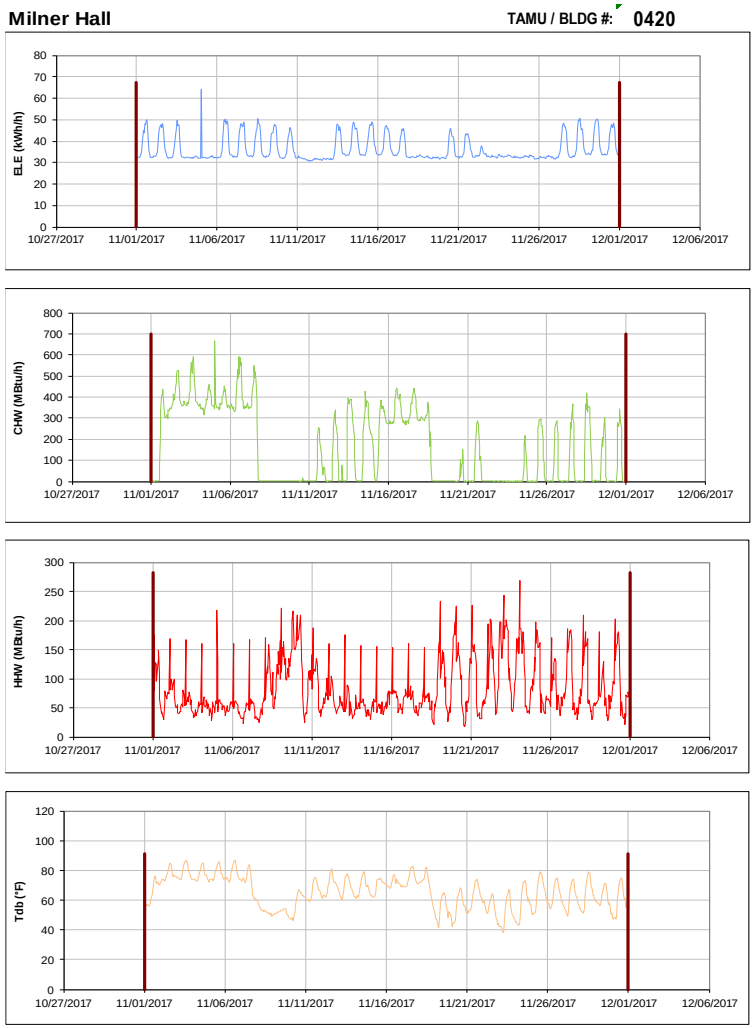


Figure III-48 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Milner Hall during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

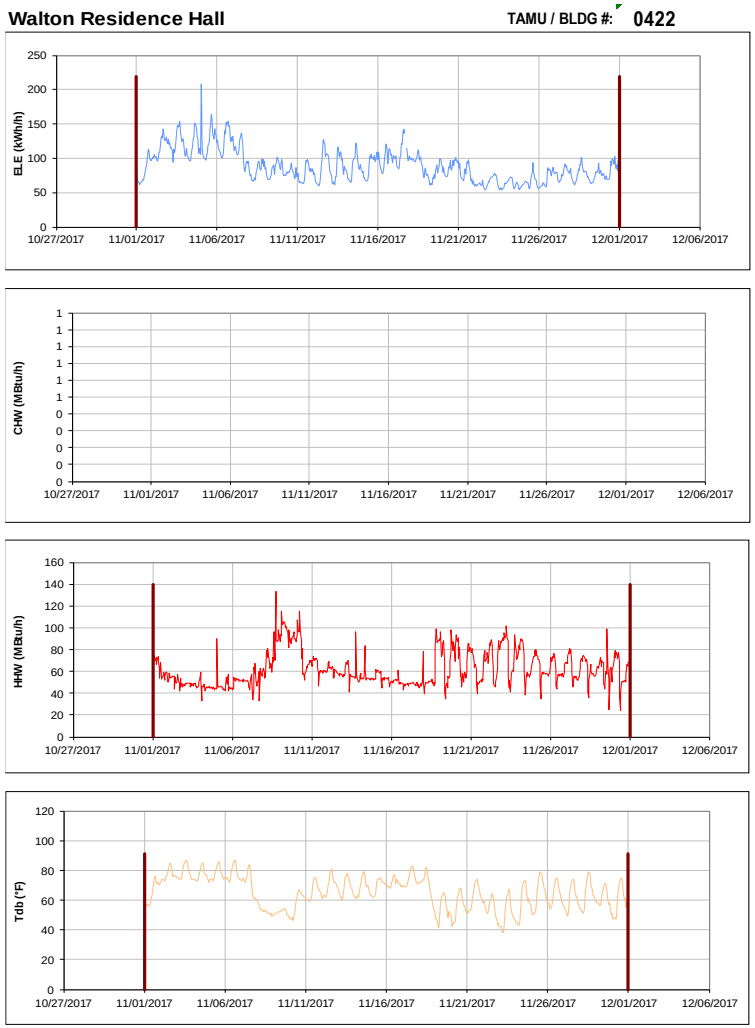


Figure III-49 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Walton Residence Hall during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

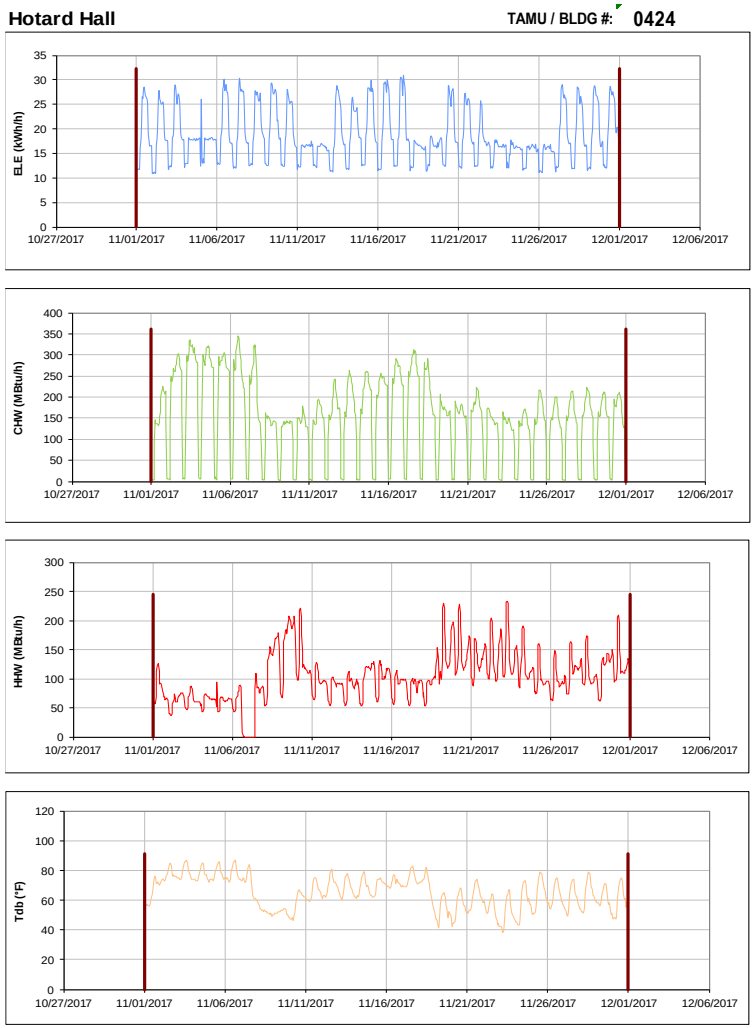


Figure III-50 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Hotard Hall during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

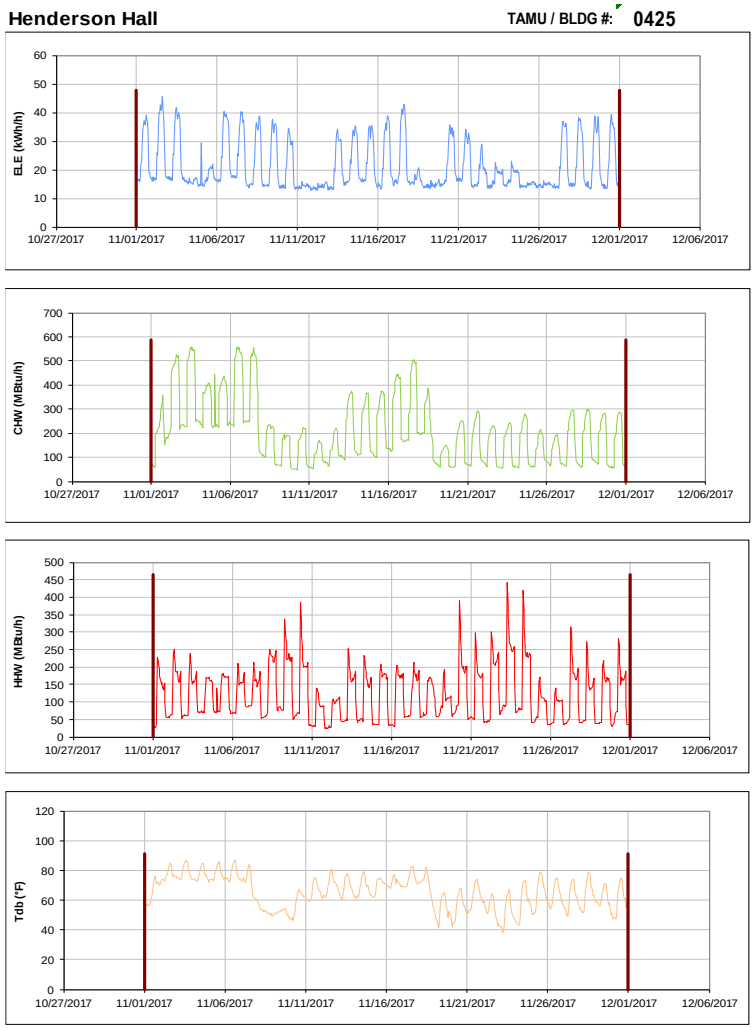


Figure III-51 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Henderson Hall during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

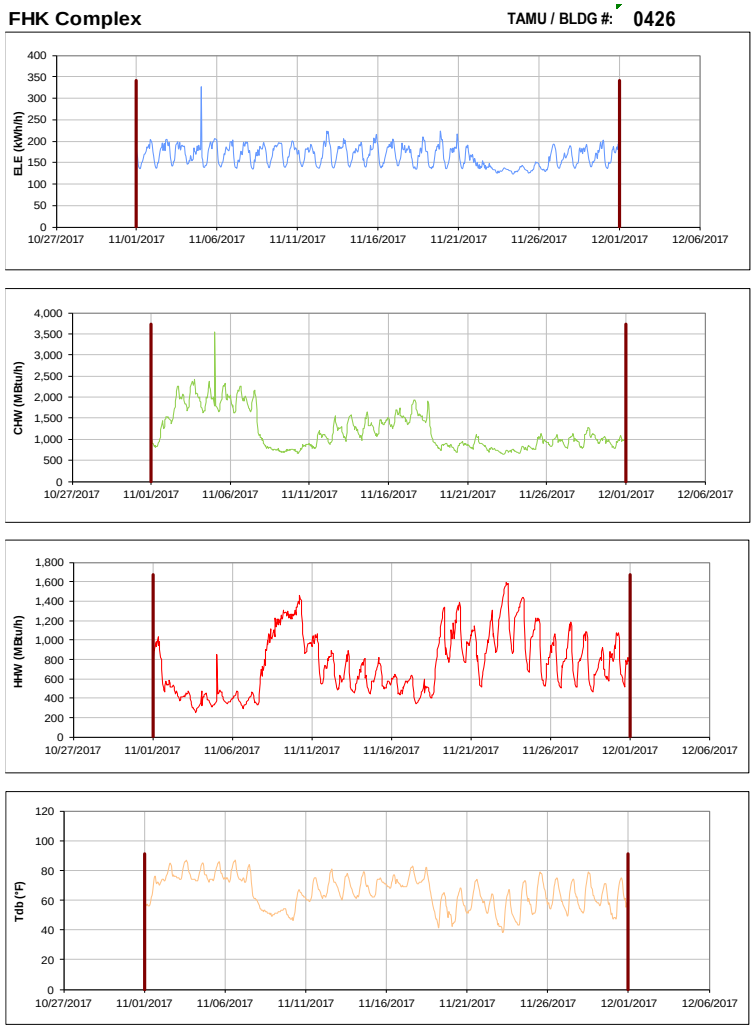


Figure III-52 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for FHK Complex during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

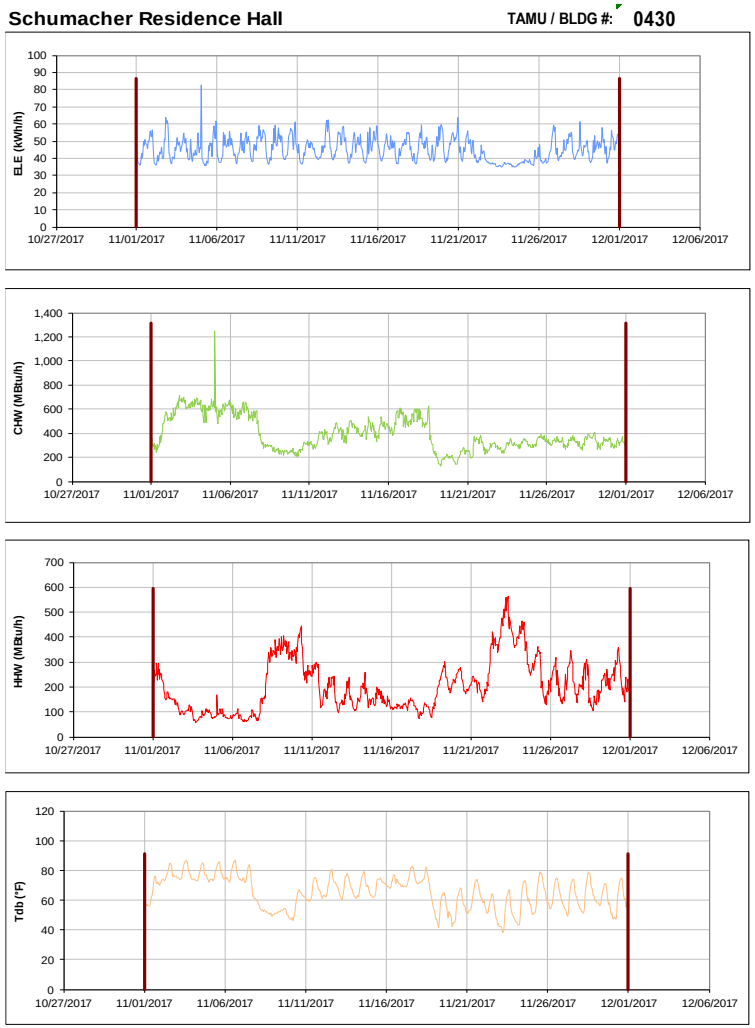


Figure III-53 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Schumacher Residence Hall during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

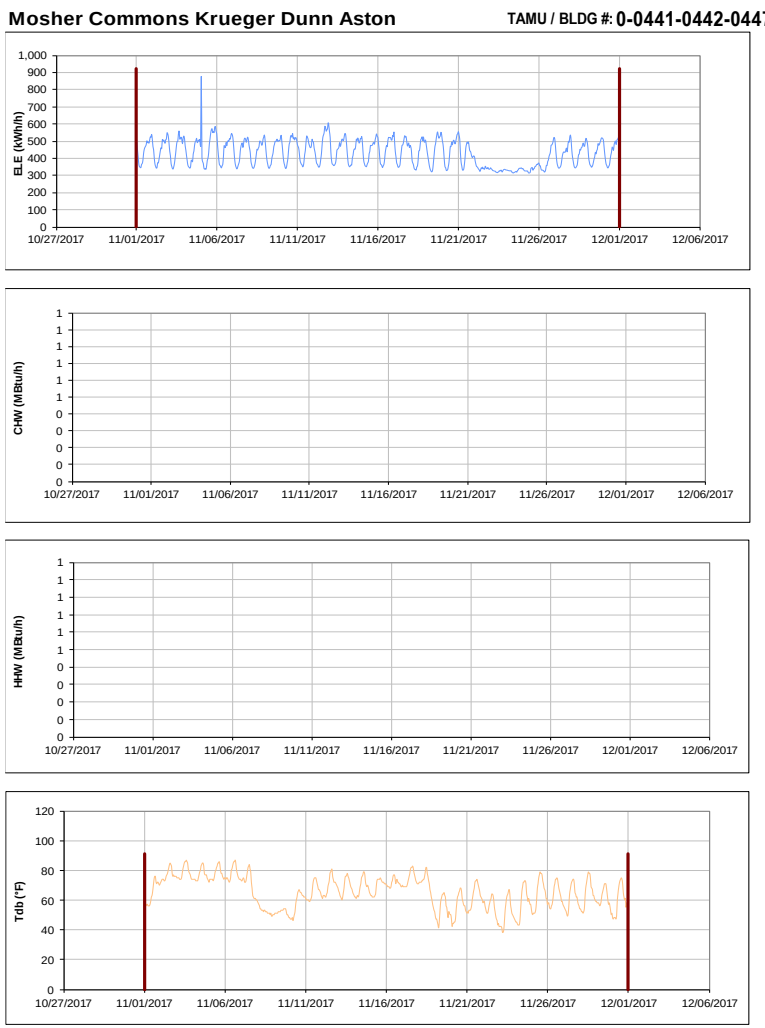


Figure III-54 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Mosher Commons Krueger Dunn Aston during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

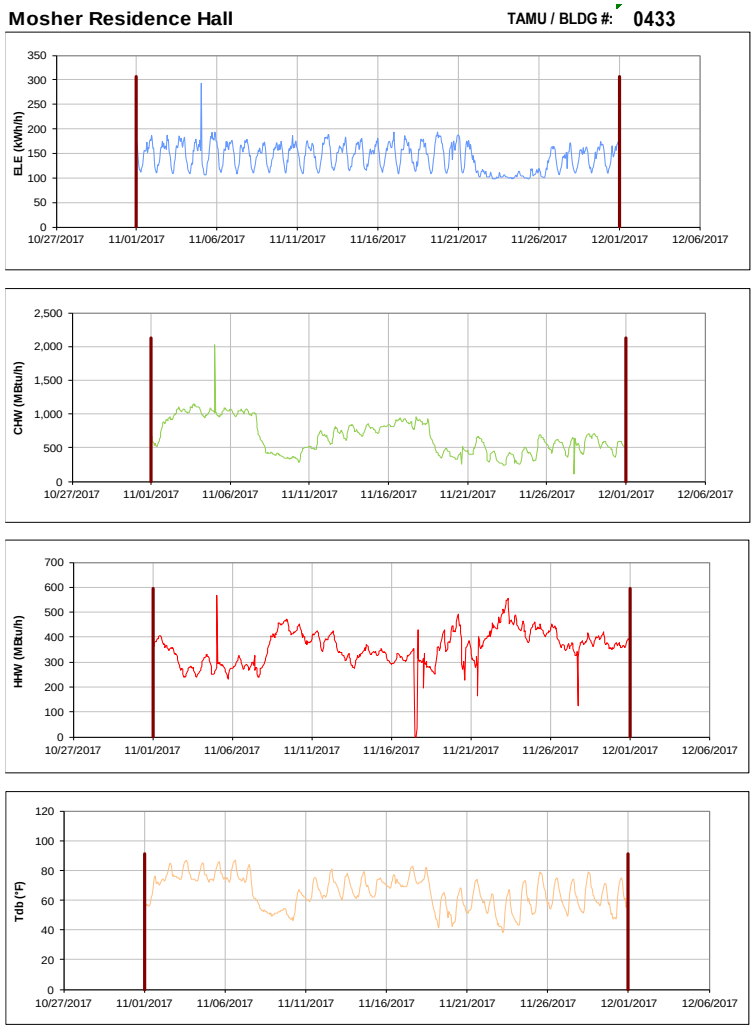


Figure III-55 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Mosher Residence Hall during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-56 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Commons Krueger during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-57 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Commons Hall during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-58 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Krueger Residence Hall during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

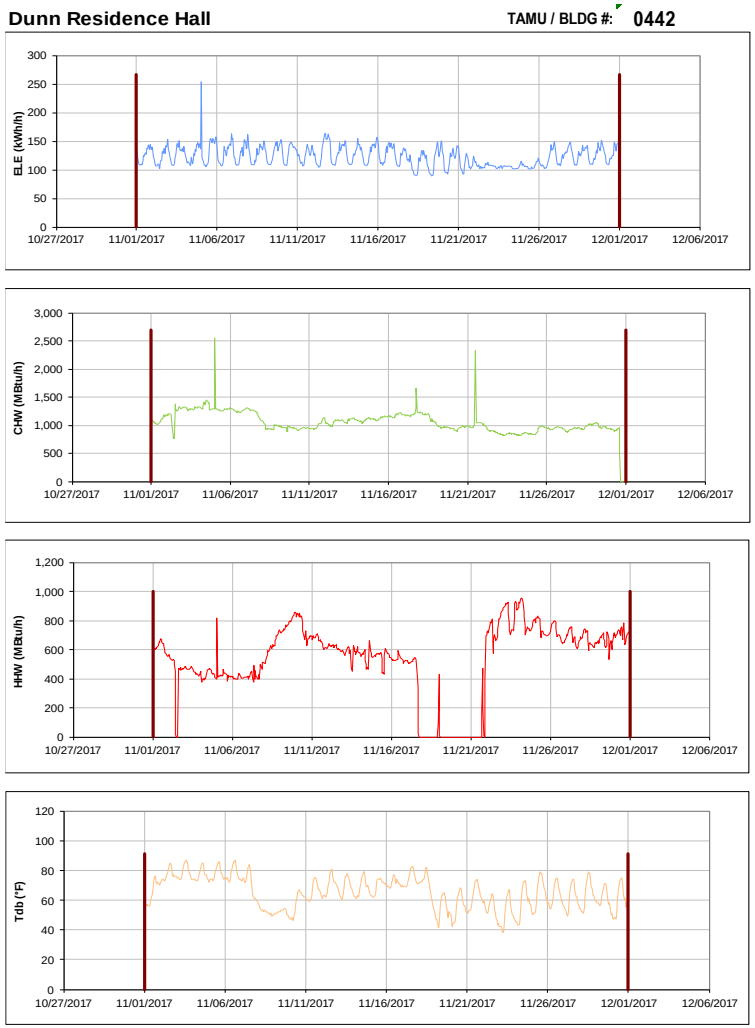


Figure III-59 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Dunn Residence Hall during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

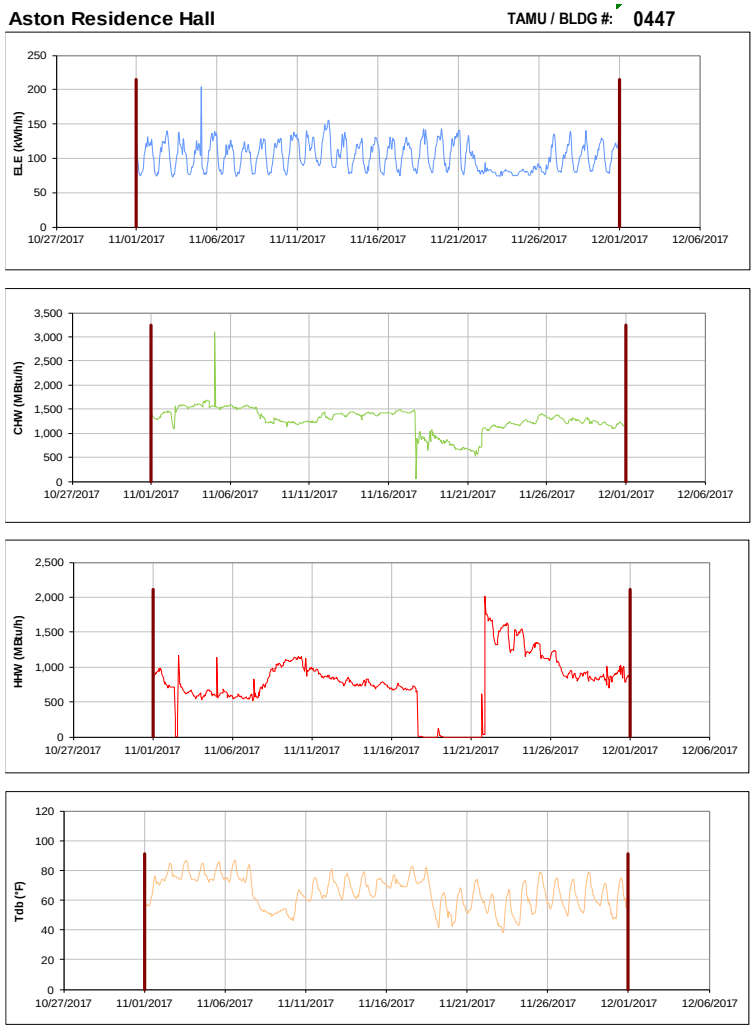


Figure III-60 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Aston Residence Hall during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-61 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Luedecke Building (Cyclotron) during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-62 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Harrington Education Center Office Tower during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

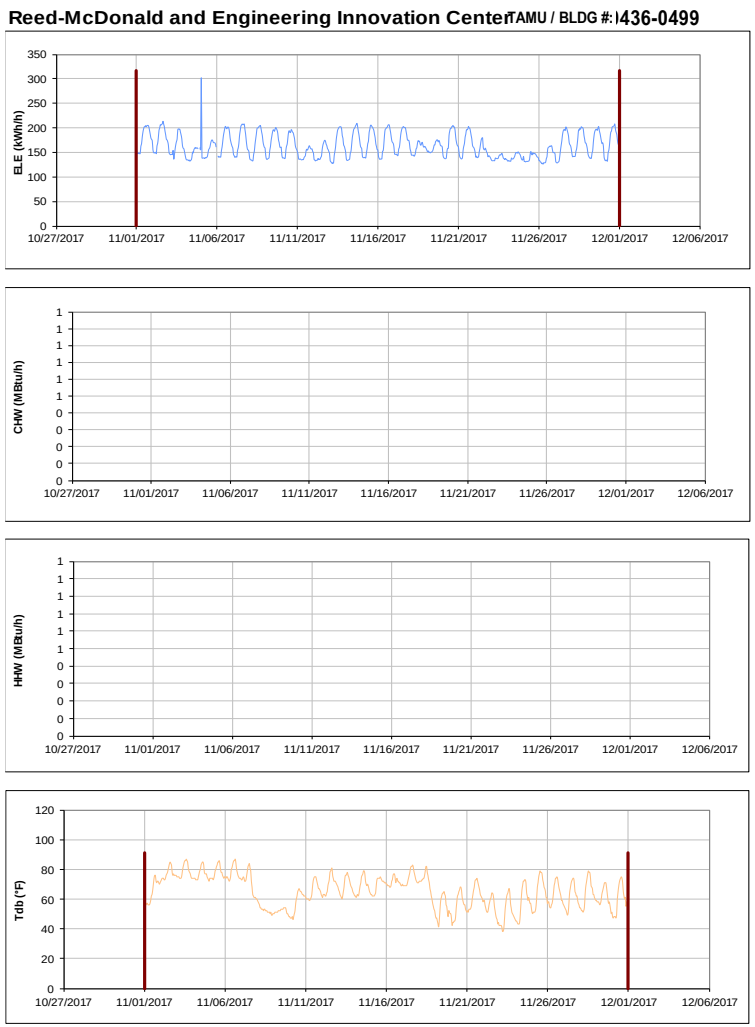


Figure III-63 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Reed-McDonald and Engineering Innovation Center during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-64 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Reed-McDonald Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

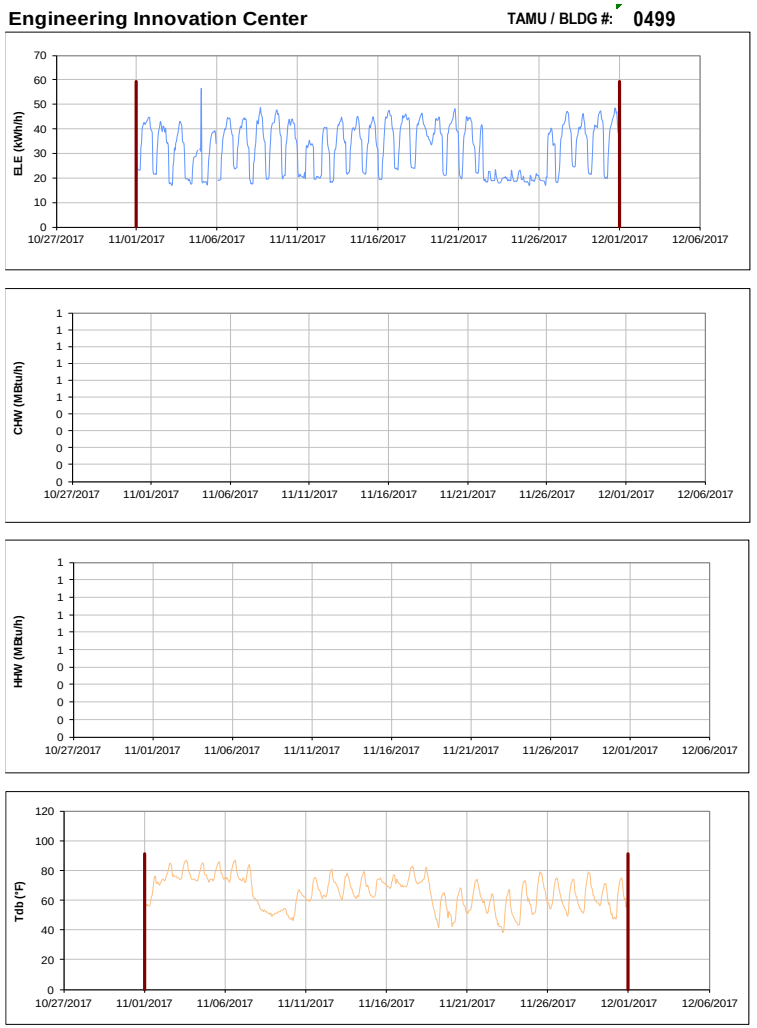


Figure III-65 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Engineering Innovation Center during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

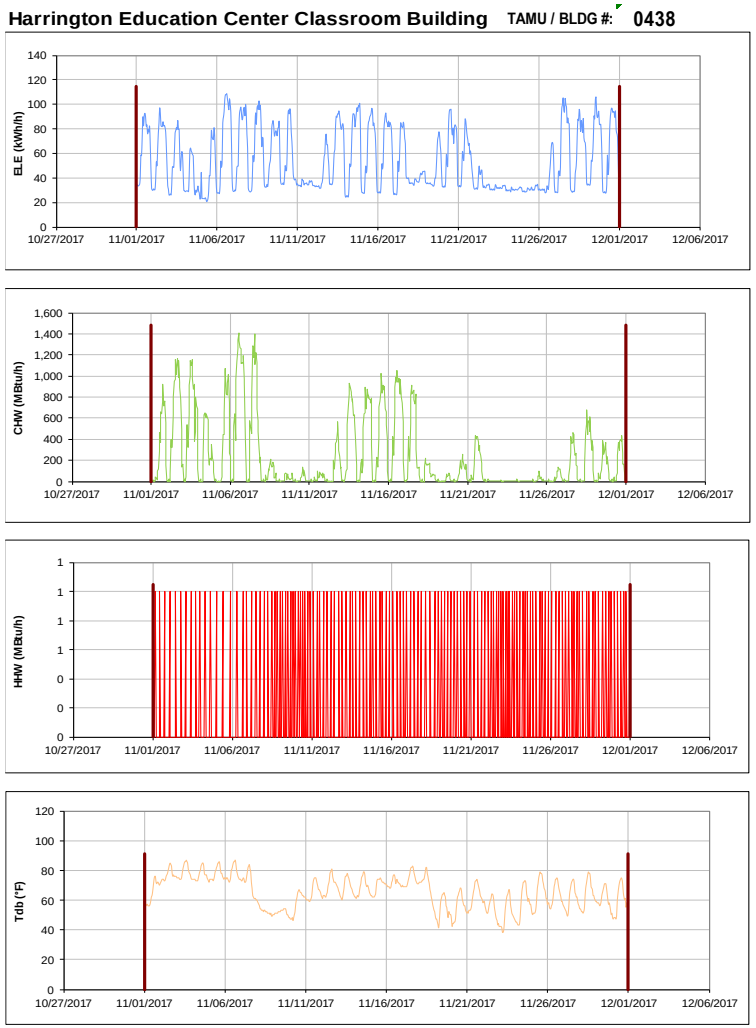


Figure III-66 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Harrington Education Center Classroom Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

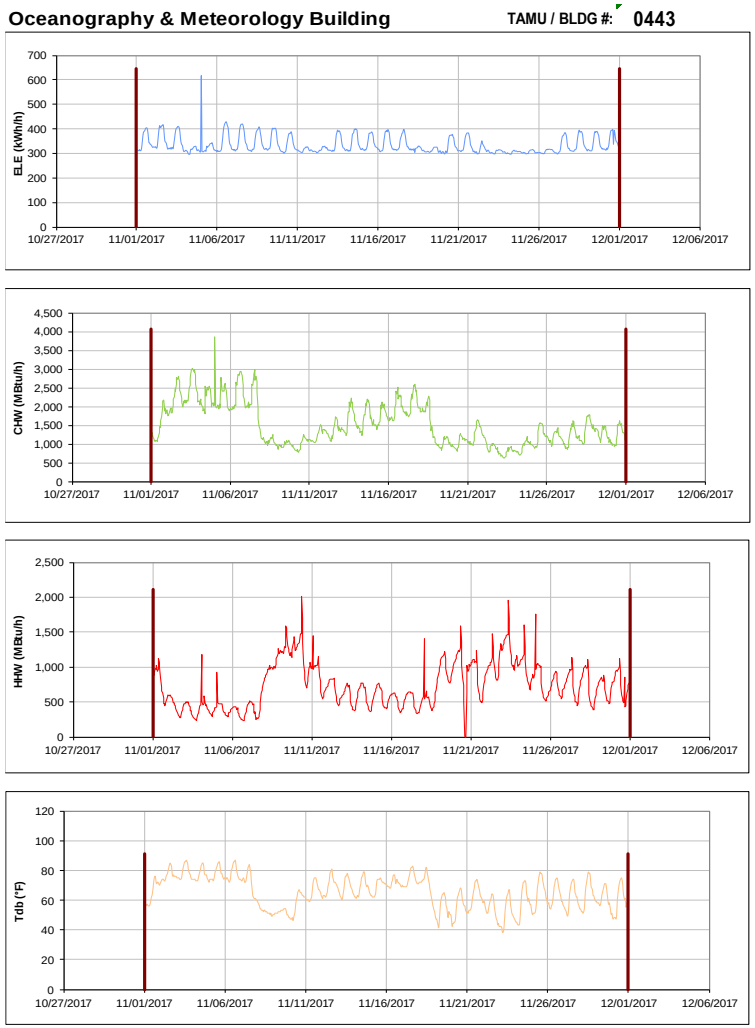


Figure III-67 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Oceanography & Meteorology Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

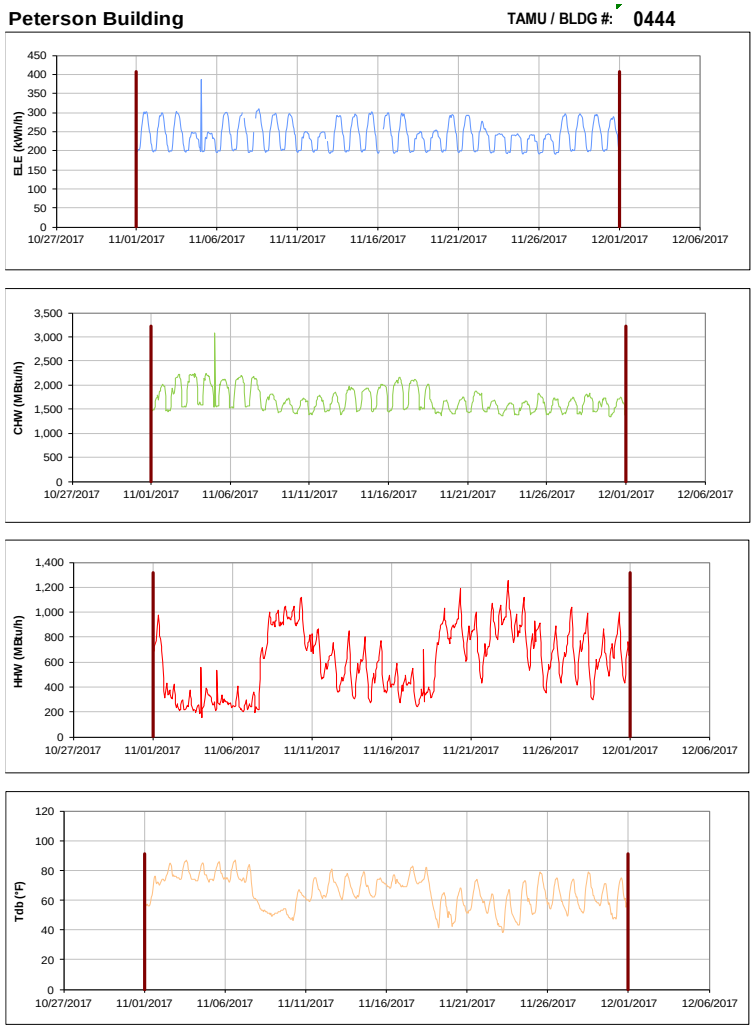


Figure III-68 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Peterson Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

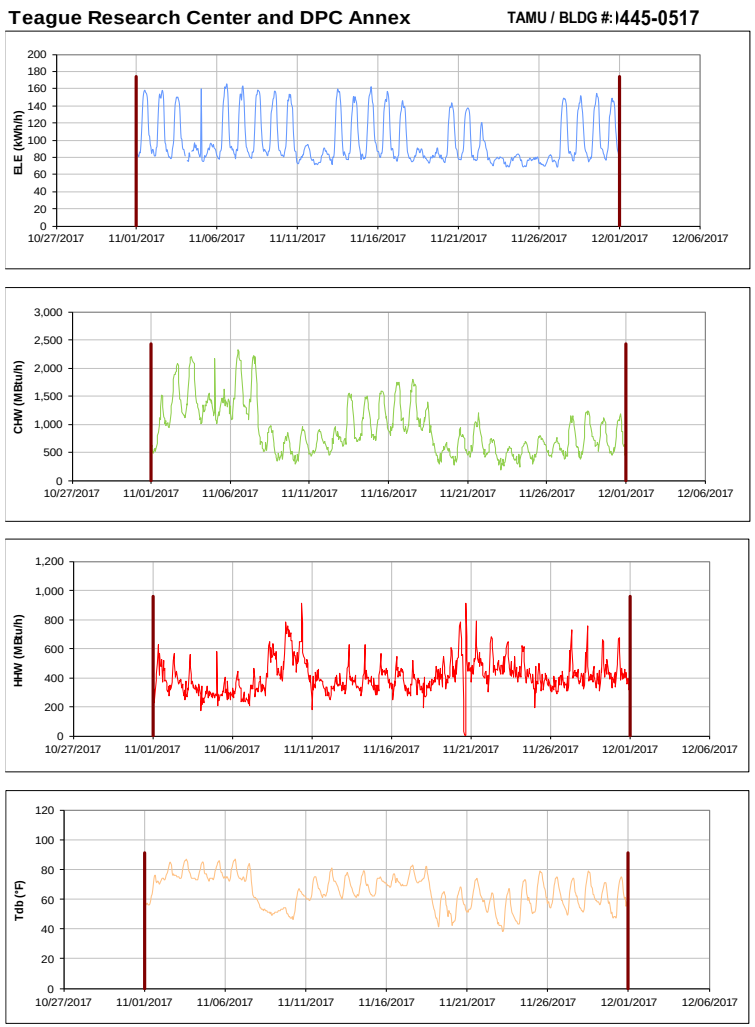


Figure III-69 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Teague Research Center and DPC Annex during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-70 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Teague Research Center during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

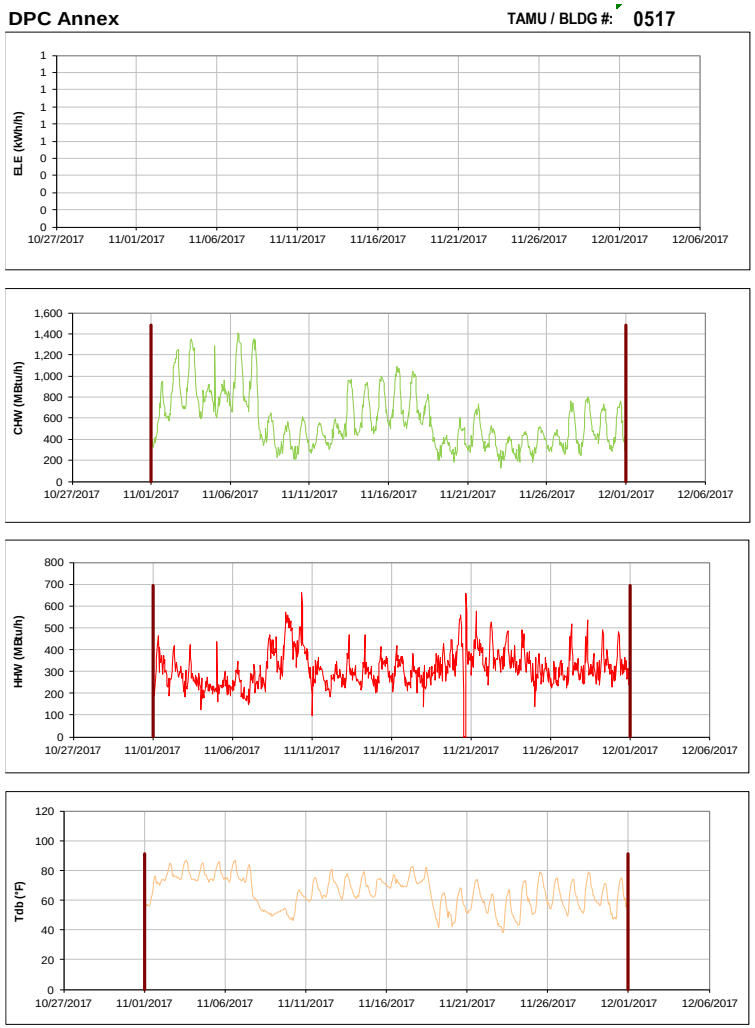


Figure III-71 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for DPC Annex during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

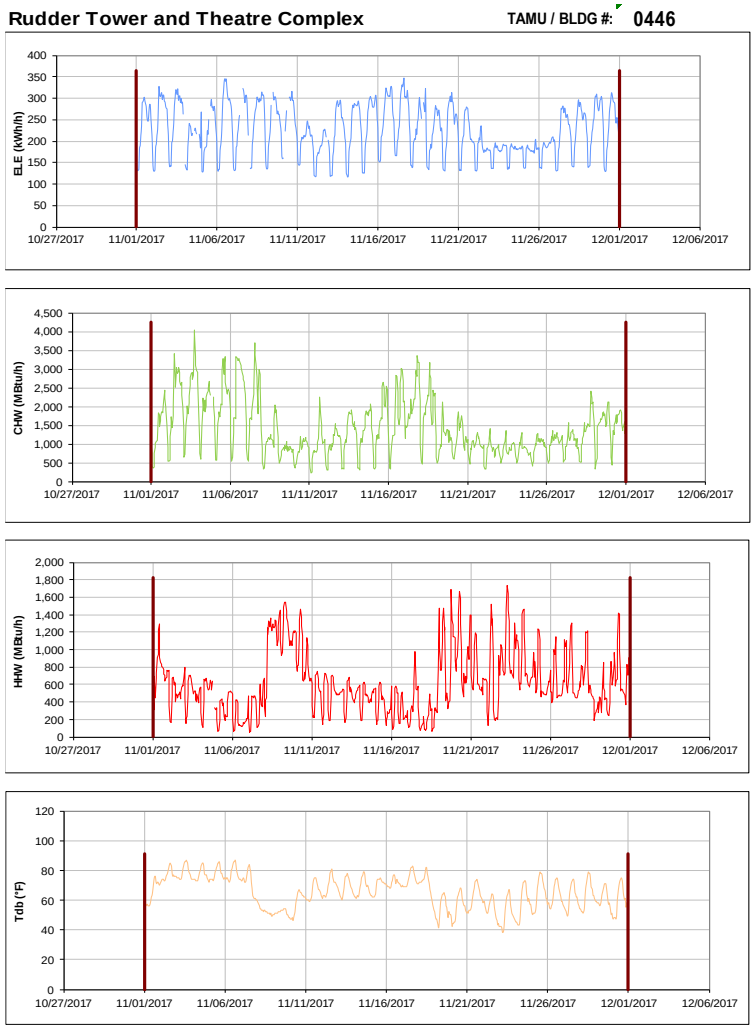


Figure III-72 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Rudder Tower and Theatre Complex during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

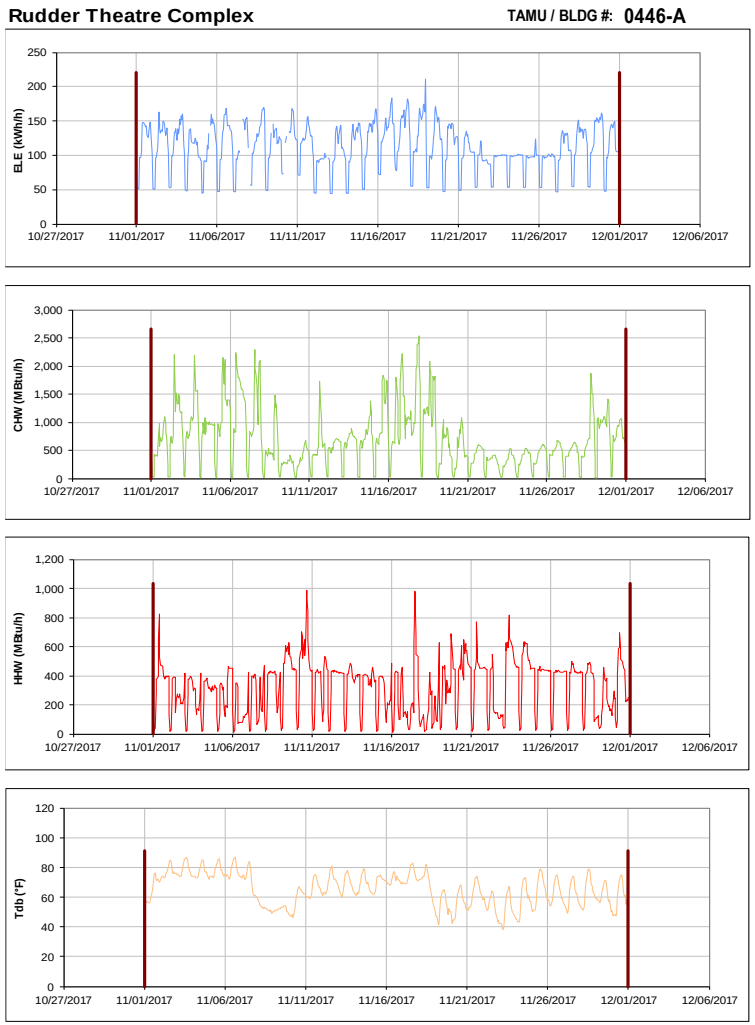


Figure III-73 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Rudder Theatre Complex during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

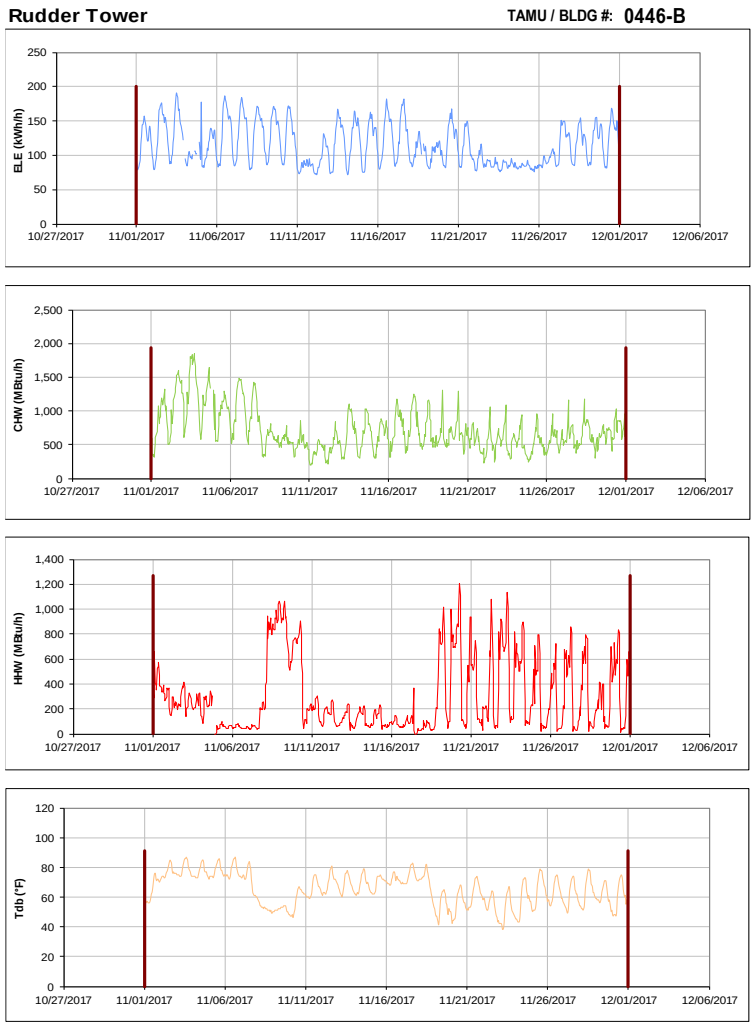


Figure III-74 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Rudder Tower during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

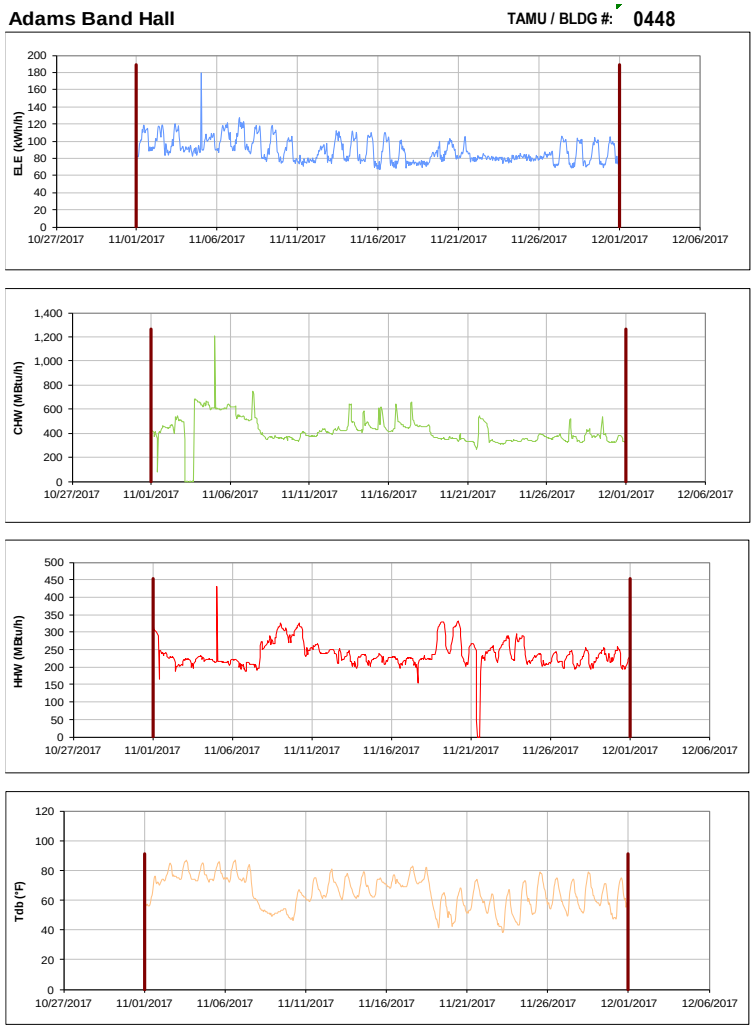


Figure III-75 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Adams Band Hall during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-76 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Biological Sciences Building - West during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

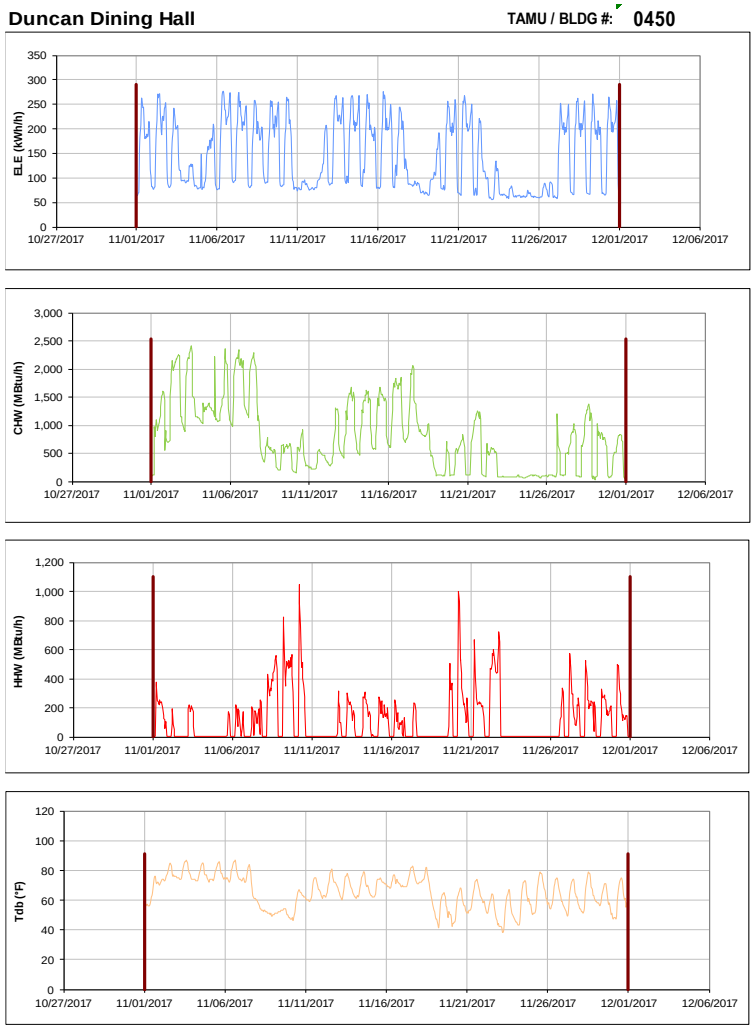


Figure III-77 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Duncan Dining Hall during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

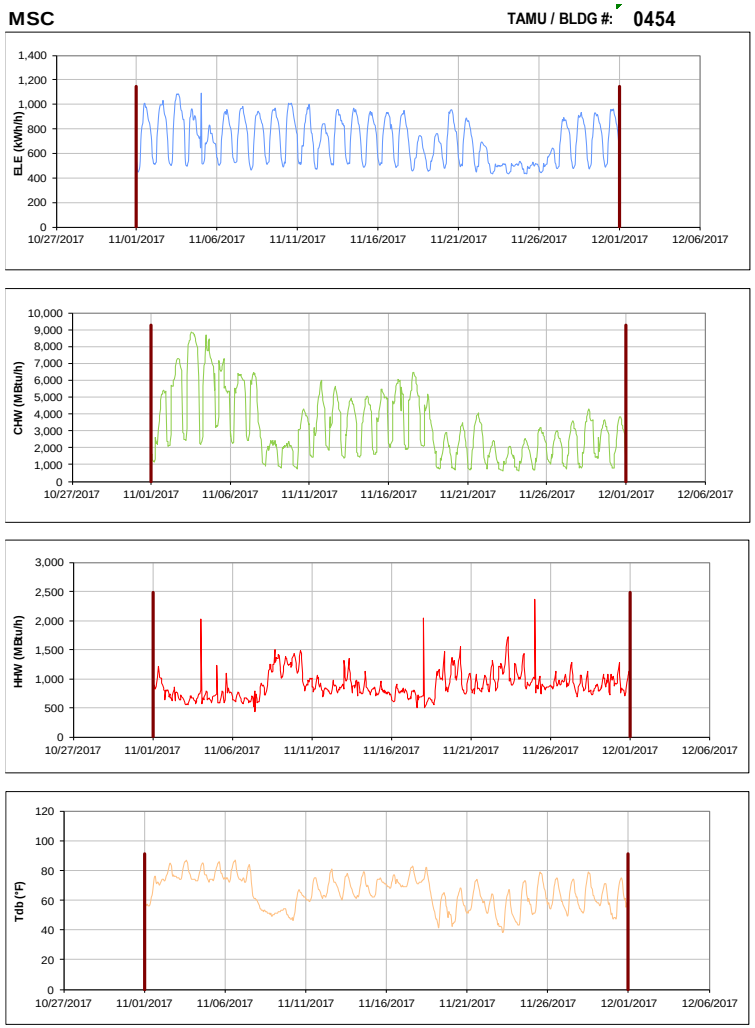


Figure III-78 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for MSC during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

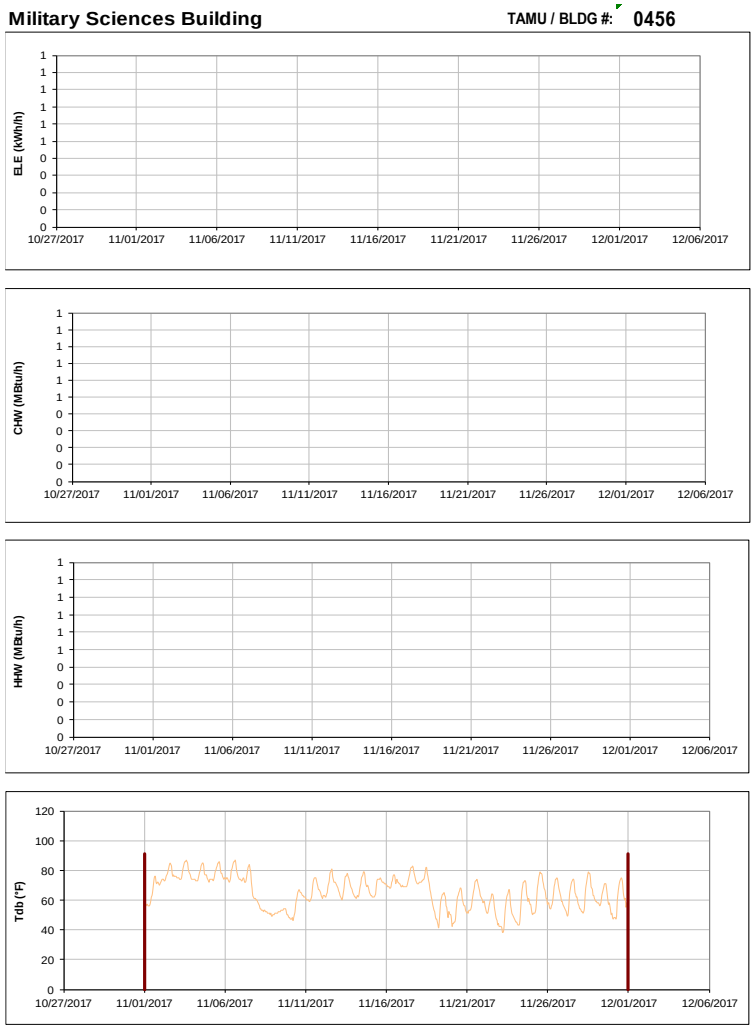


Figure III-79 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Military Sciences Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

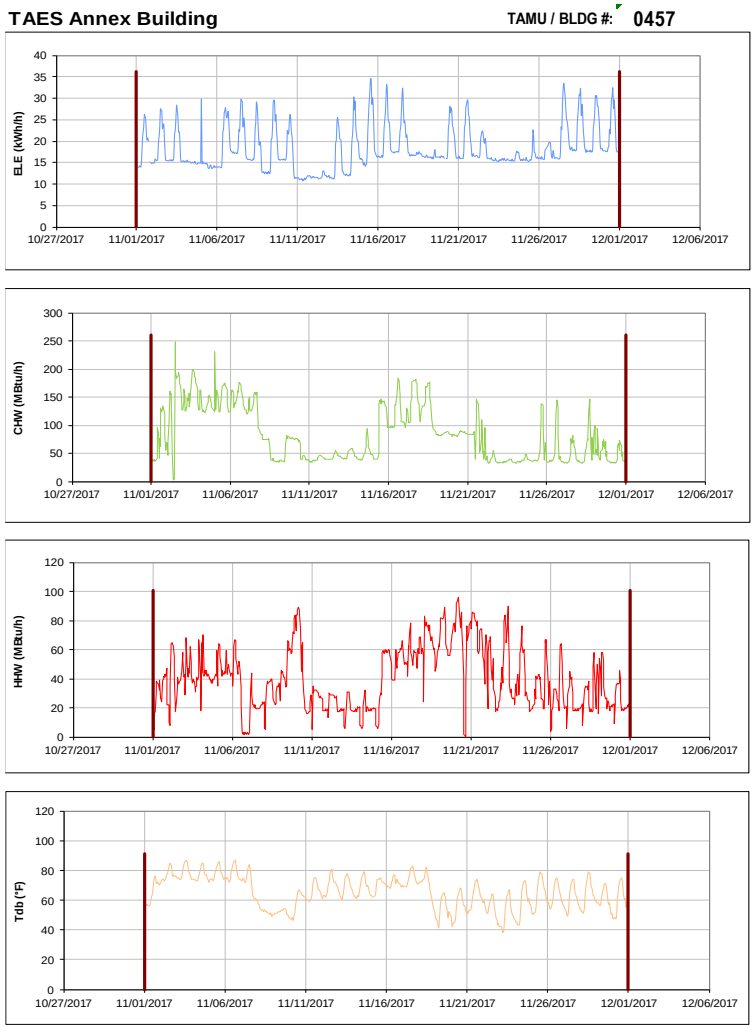


Figure III-80 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for TAES Annex Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-81 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Coke Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-82 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Academic Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

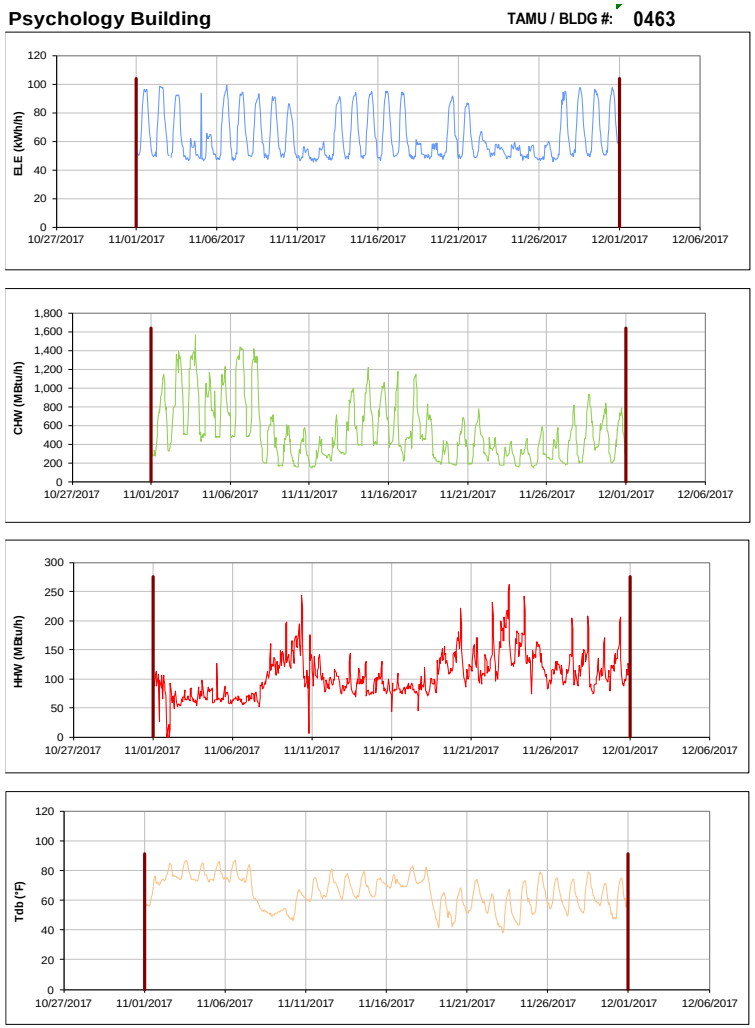


Figure III-83 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Psychology Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

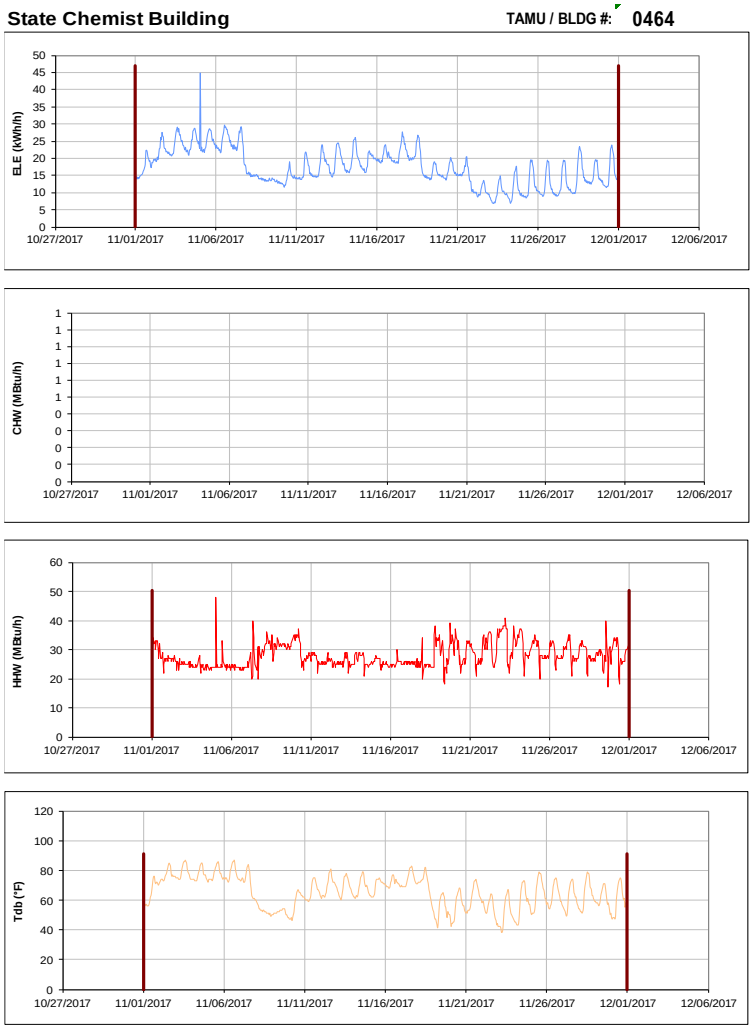


Figure III-84 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for State Chemist Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

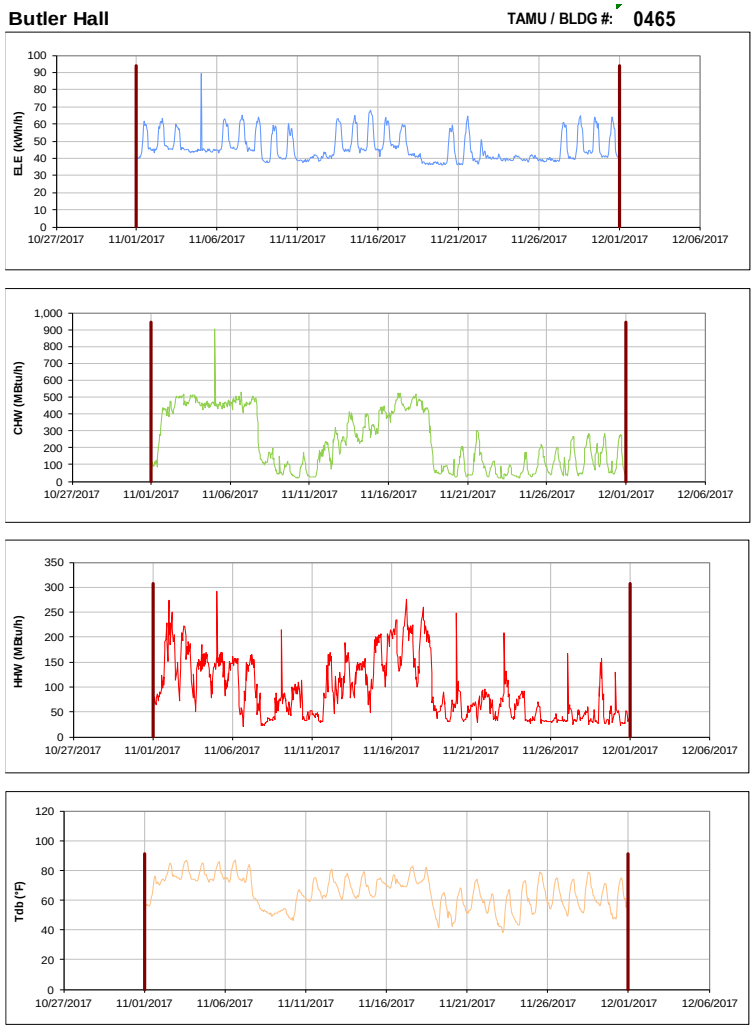


Figure III-85 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Butler Hall during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

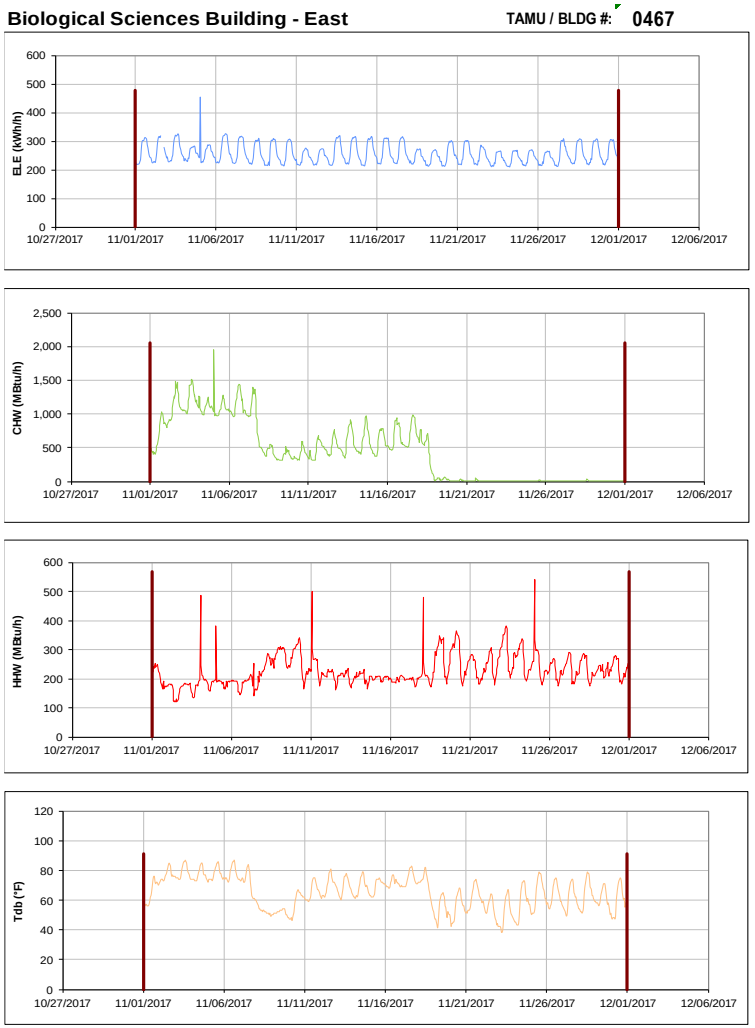


Figure III-86 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Biological Sciences Building - East during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

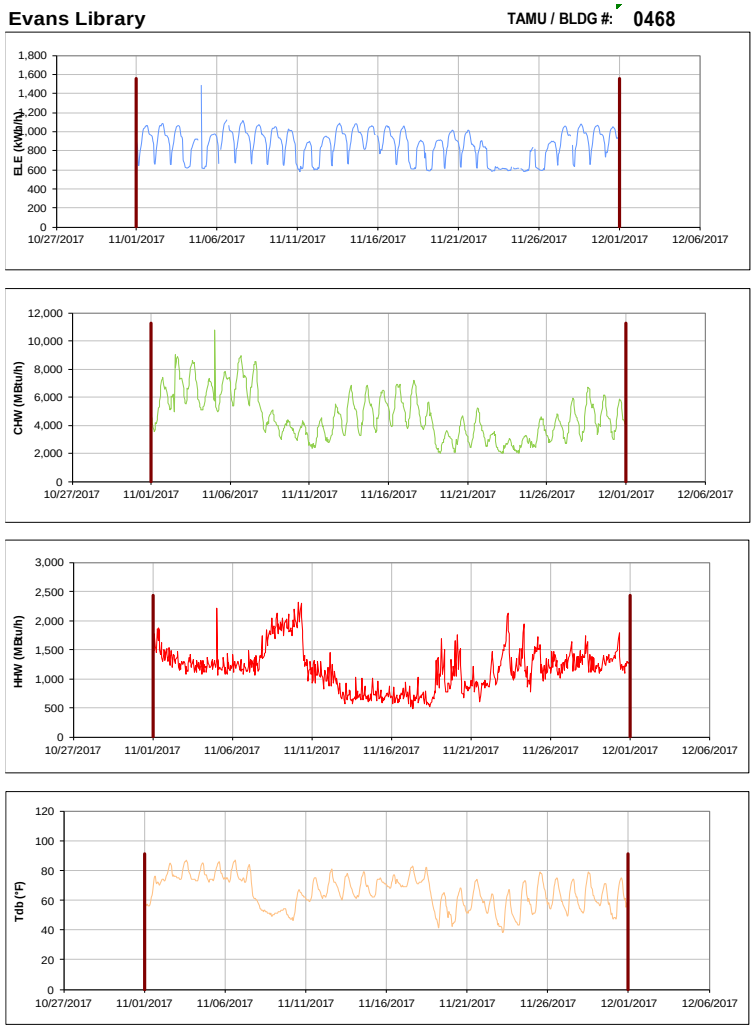


Figure III-87 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Evans Library during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

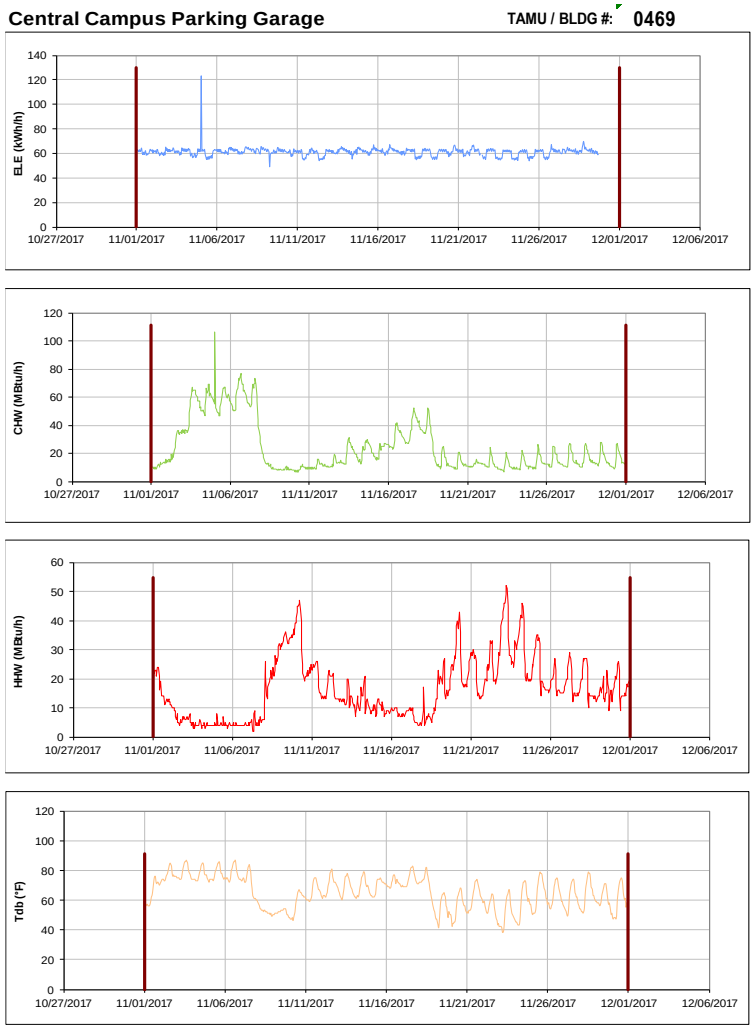


Figure III-88 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Central Campus Parking Garage during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

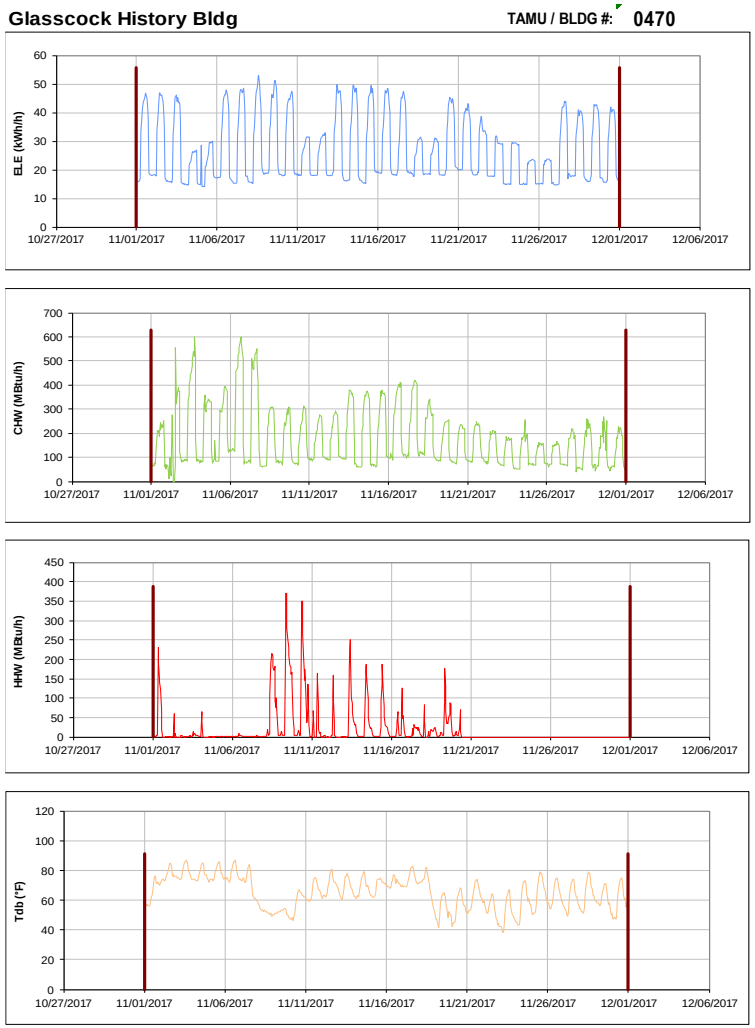


Figure III-89 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Glasscock History Bldg during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-90 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Pavilion during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-91 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Animal Industries during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

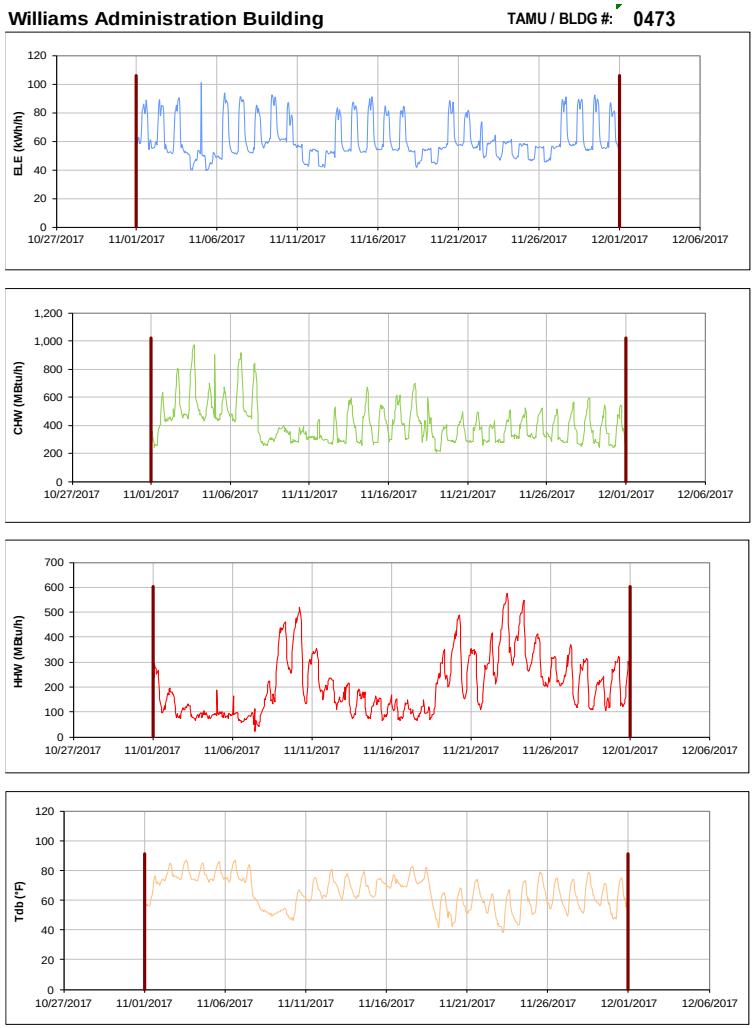


Figure III-92 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Williams Administration Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-93 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for YMCA Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-94 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Francis Hall during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-95 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Anthropology Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

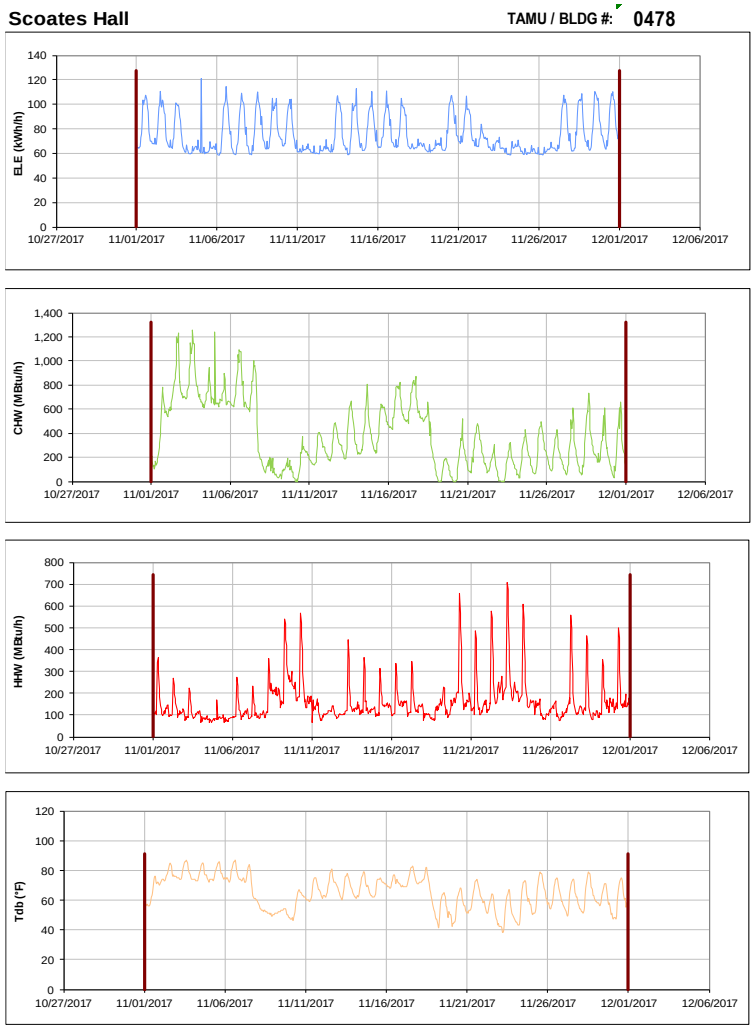


Figure III-96 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Scoates Hall during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-97 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Bolton Hall during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

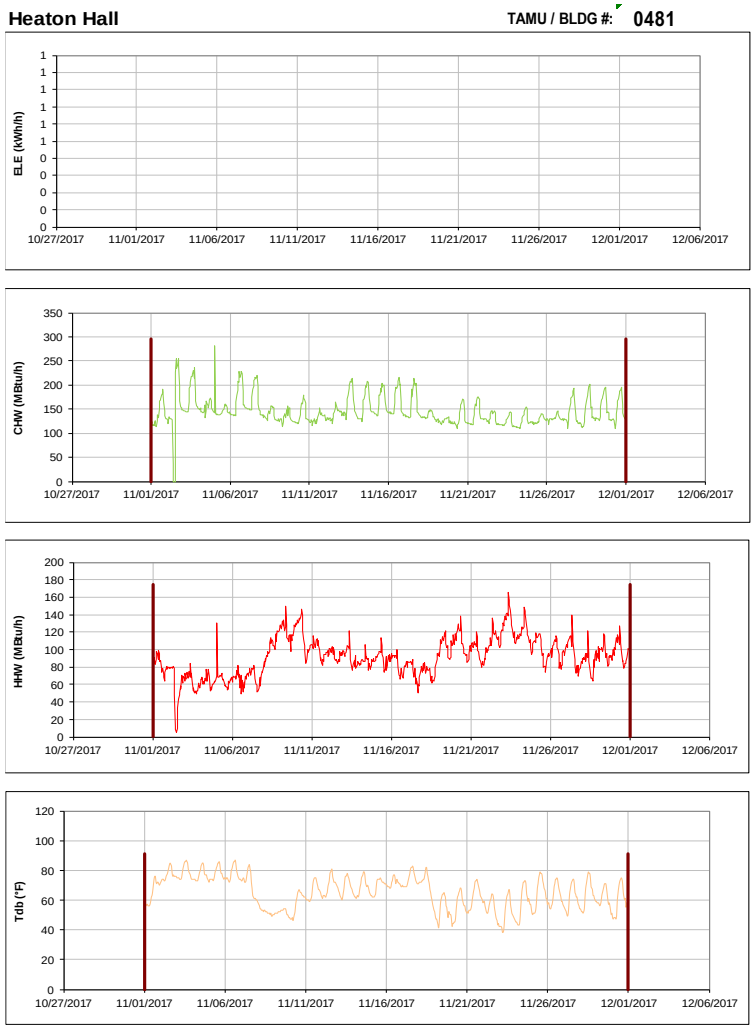


Figure III-98 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Heaton Hall during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-99 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Fermier Hall during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

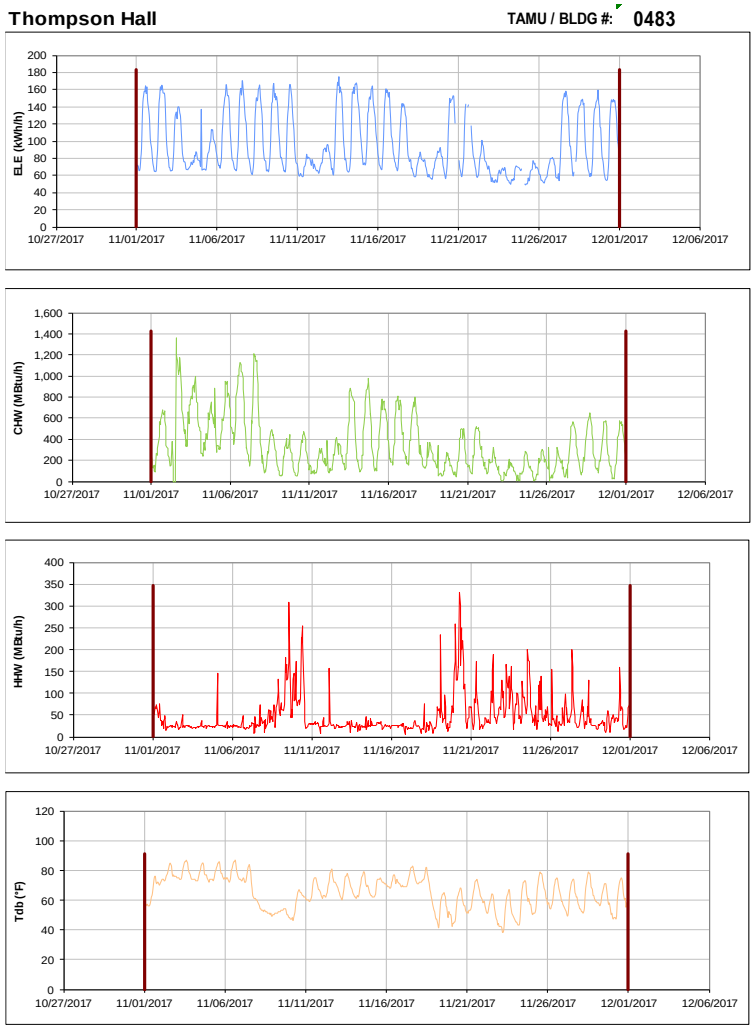


Figure III-100 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Thompson Hall during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-101 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Chemistry Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-102 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Halbouty Geosciences Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

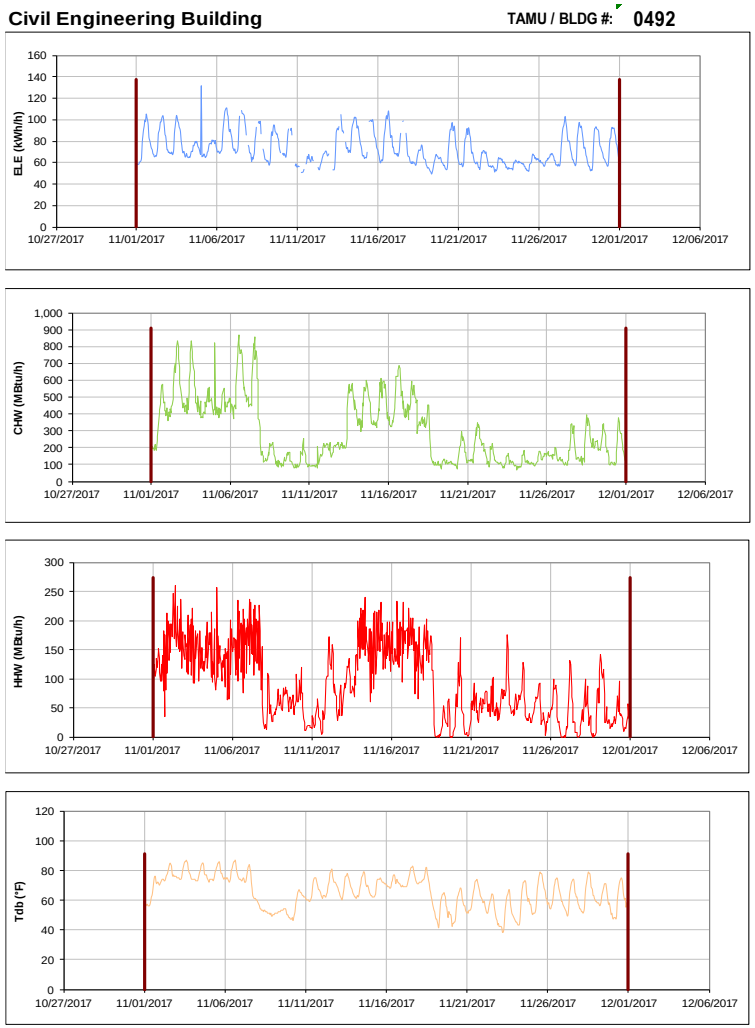


Figure III-103 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Civil Engineering Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

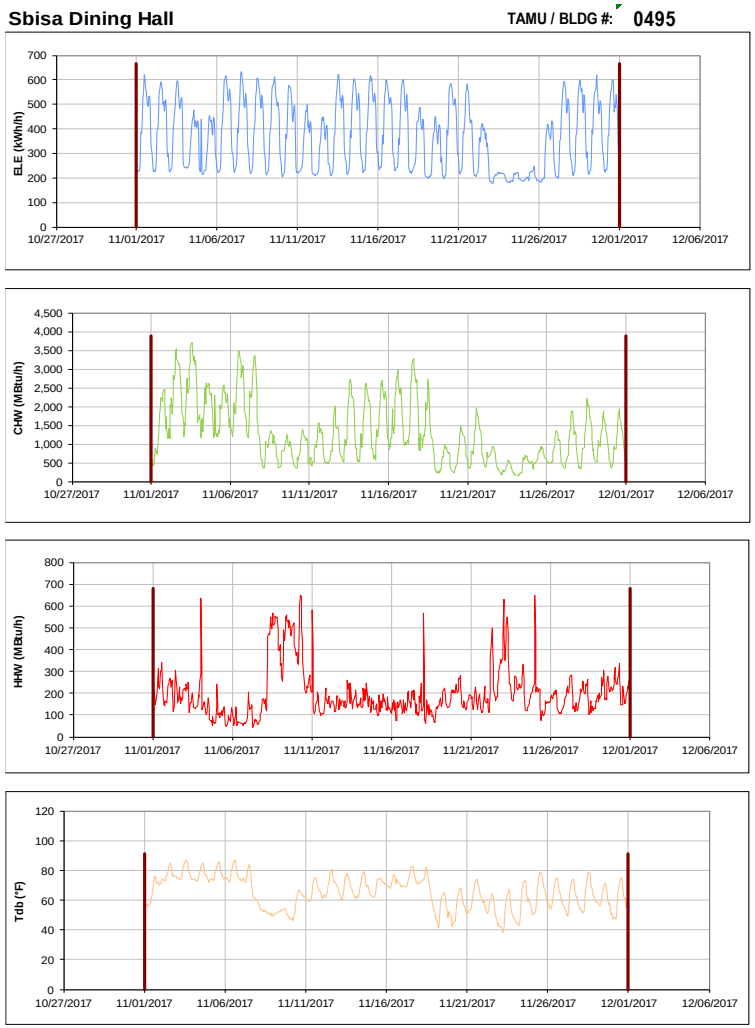


Figure III-104 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Sbisa Dining Hall during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

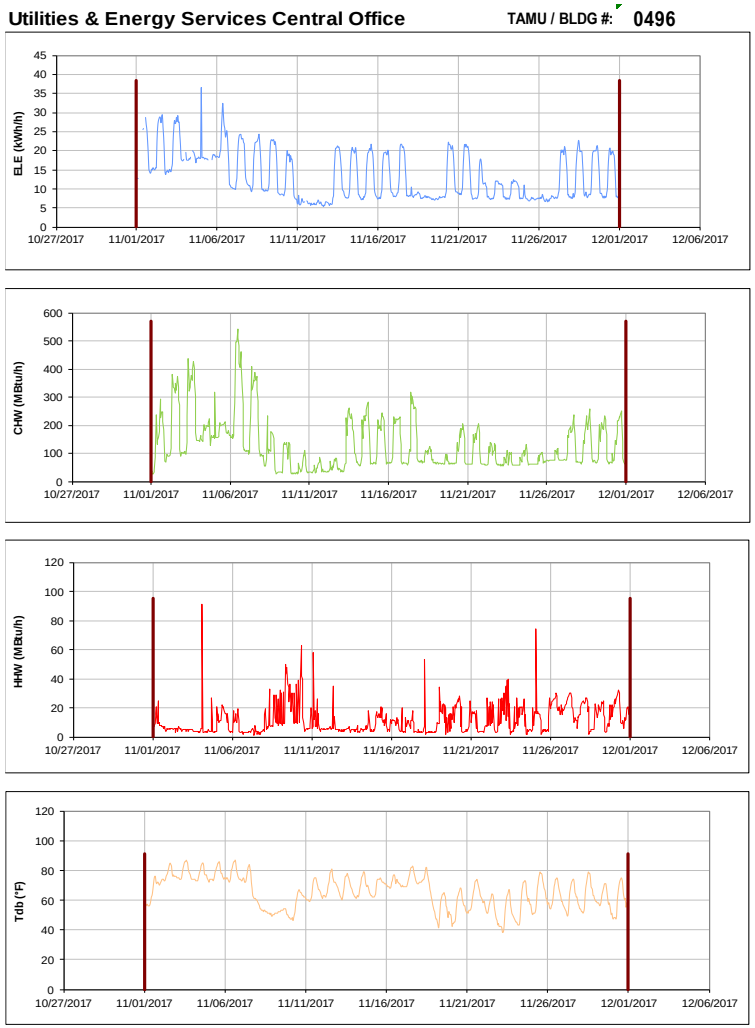


Figure III-105 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Utilities & Energy Services Central Office during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

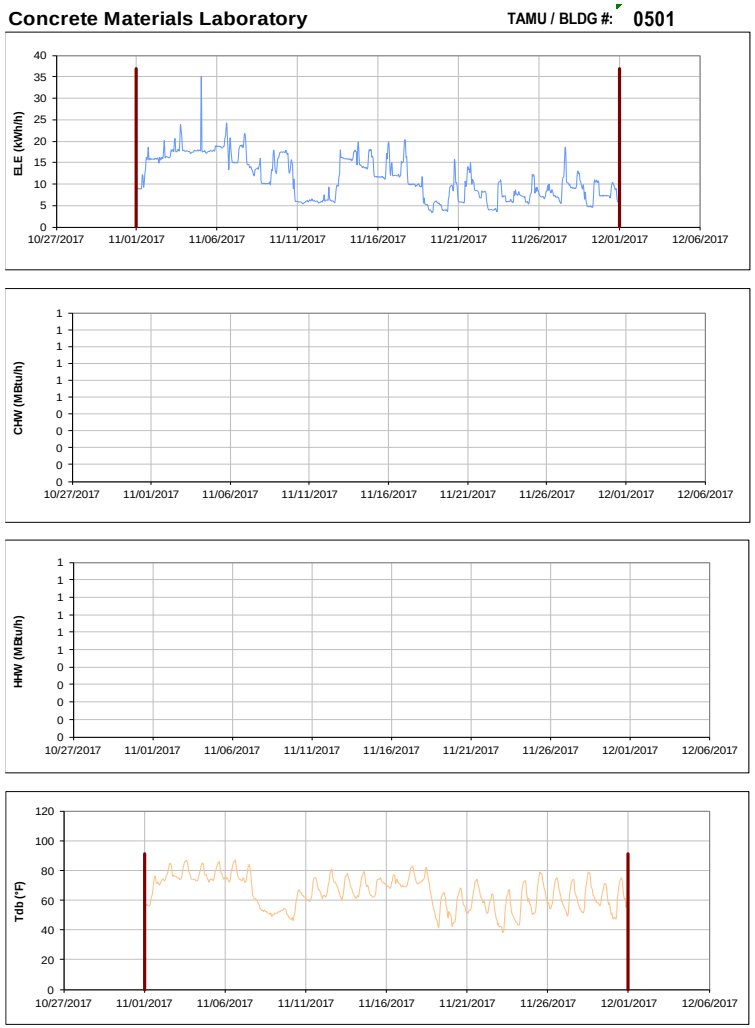


Figure III-106 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Concrete Materials Laboratory during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-107 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Nagle Hall during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

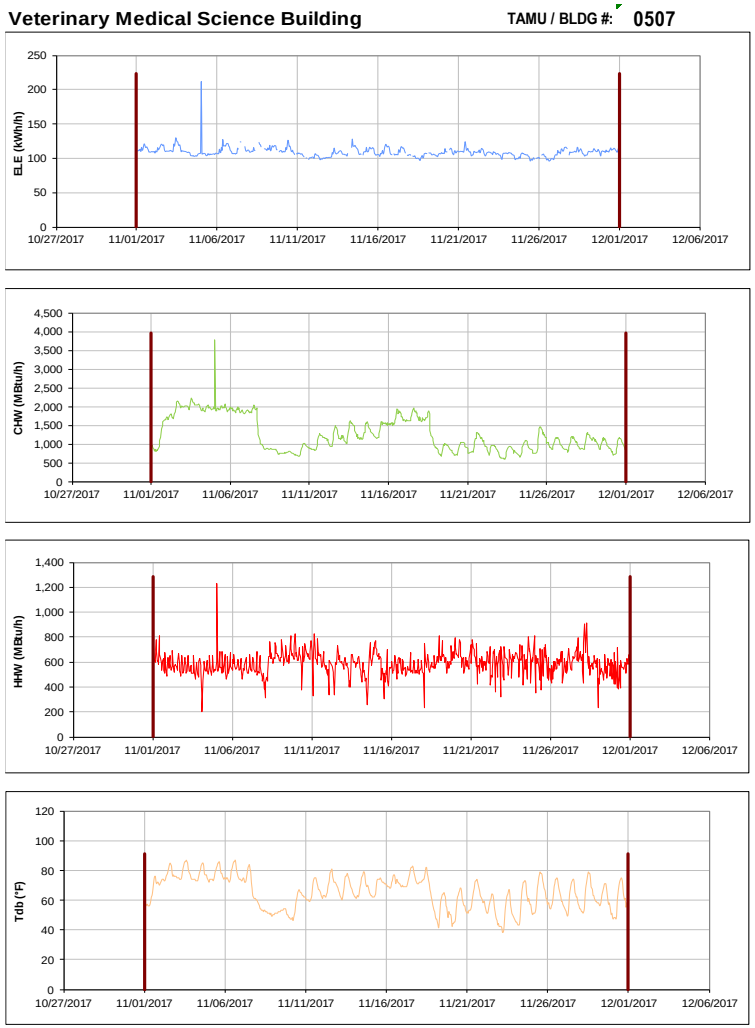


Figure III-108 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Veterinary Medical Science Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-109 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Veterinary Teaching Hospital and Med Adm during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

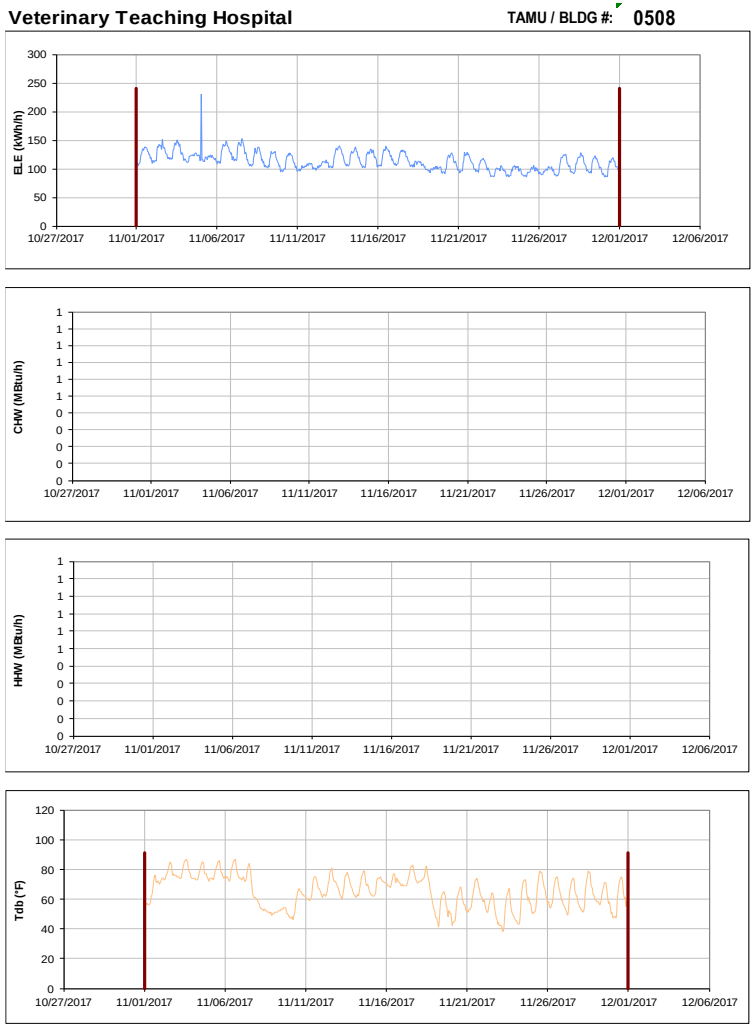


Figure III-110 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Veterinary Teaching Hospital during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

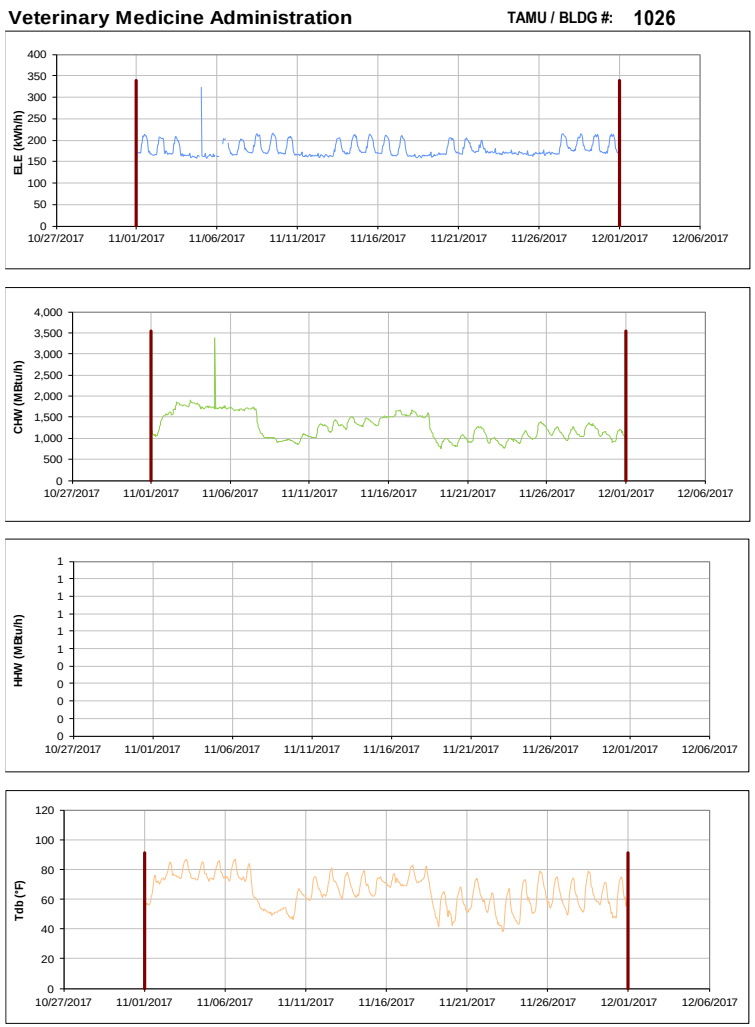


Figure III-111 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Veterinary Medicine Administration during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

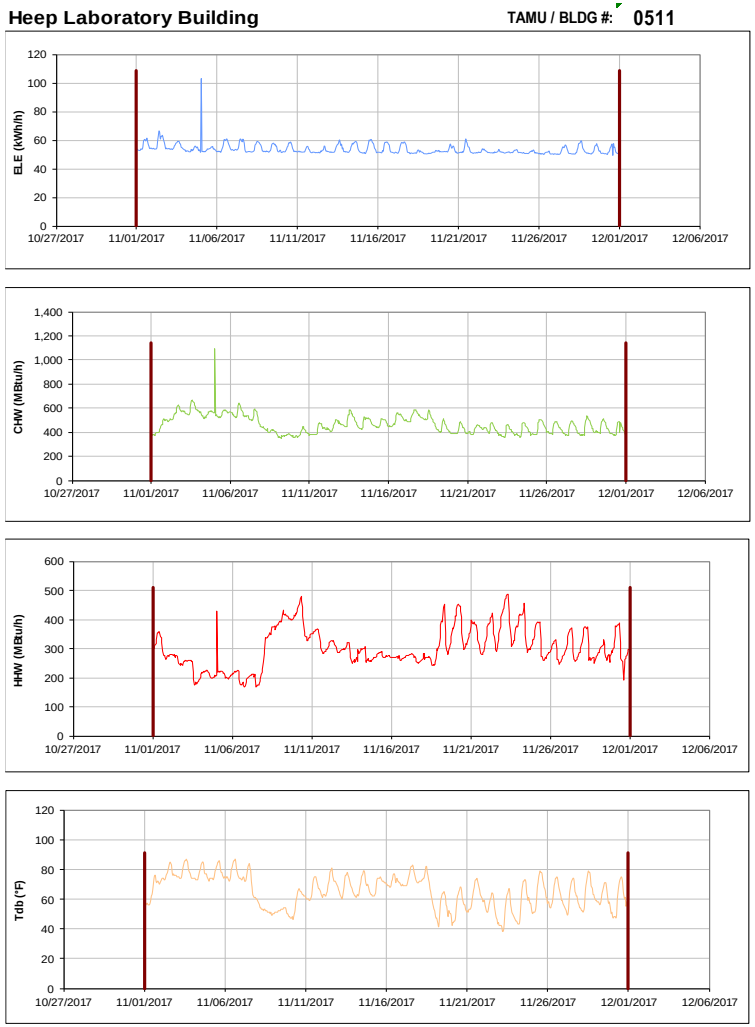


Figure III-112 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Heep Laboratory Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

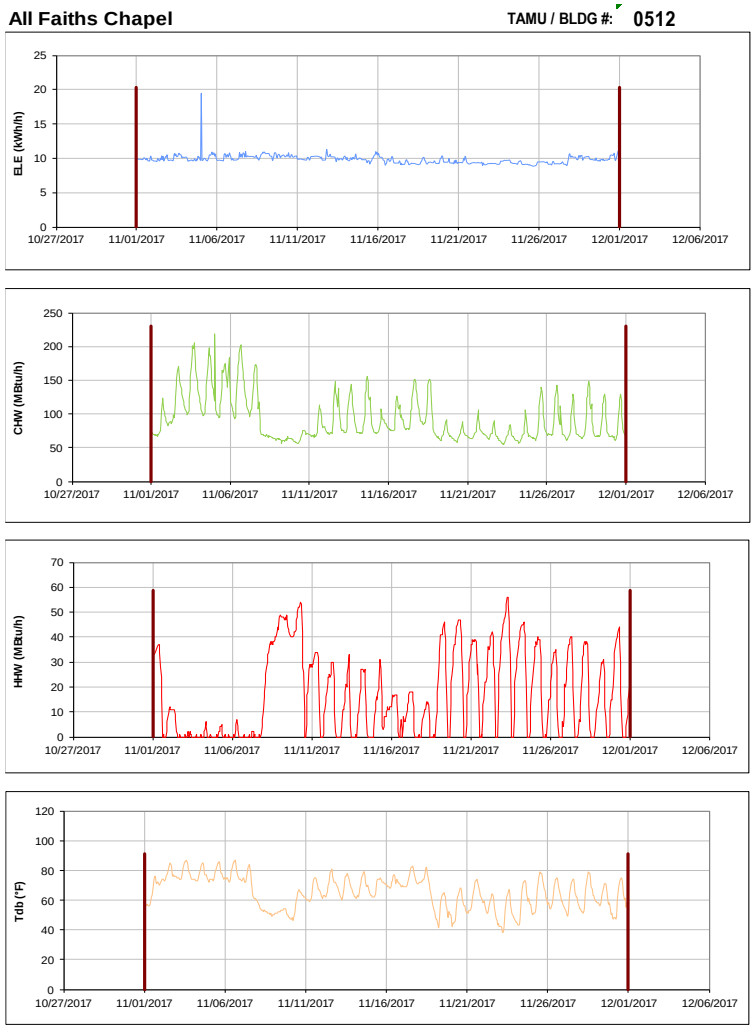


Figure III-113 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for All Faiths Chapel during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

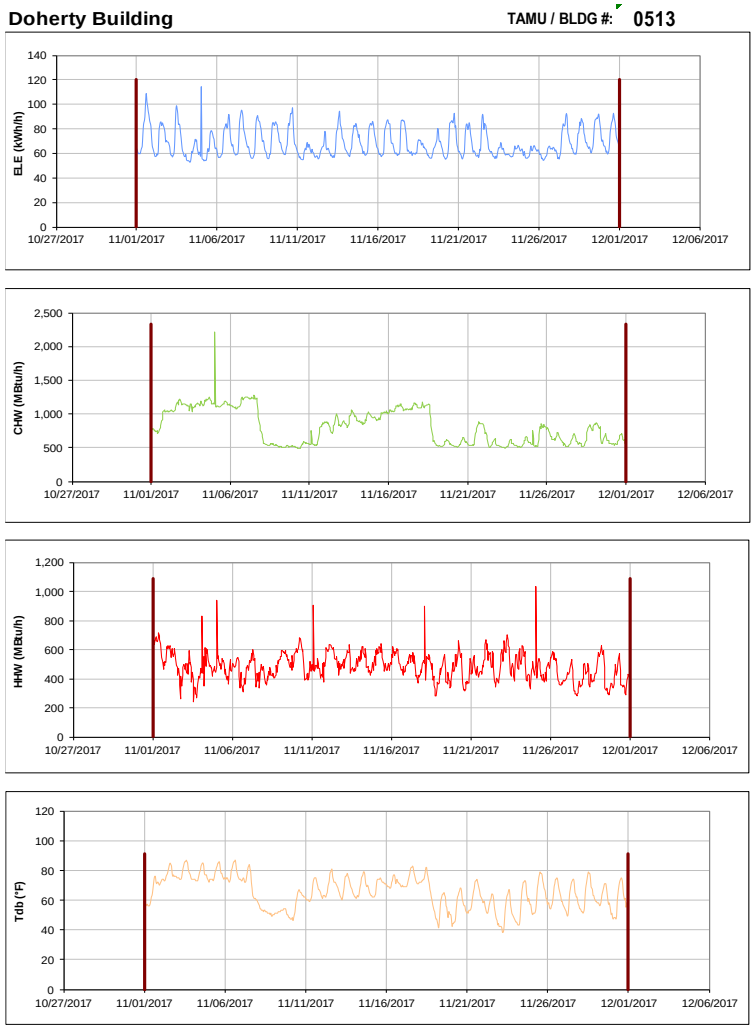


Figure III-114 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Doherty Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

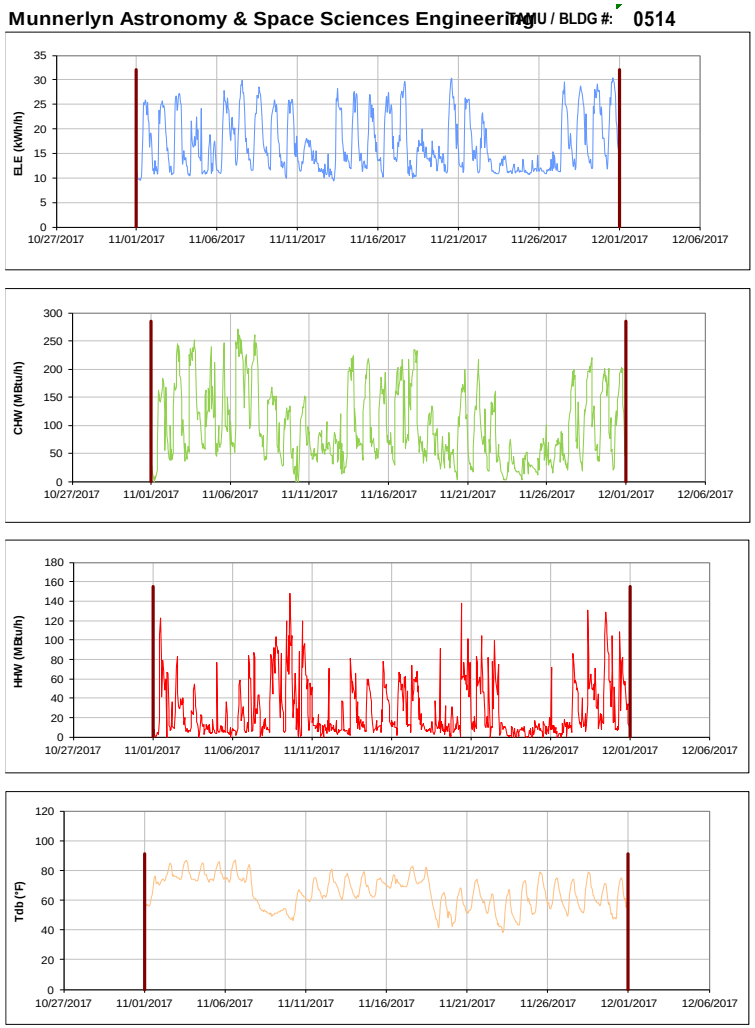


Figure III-115 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Munnerlyn Astronomy & Space Sciences Engineering during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

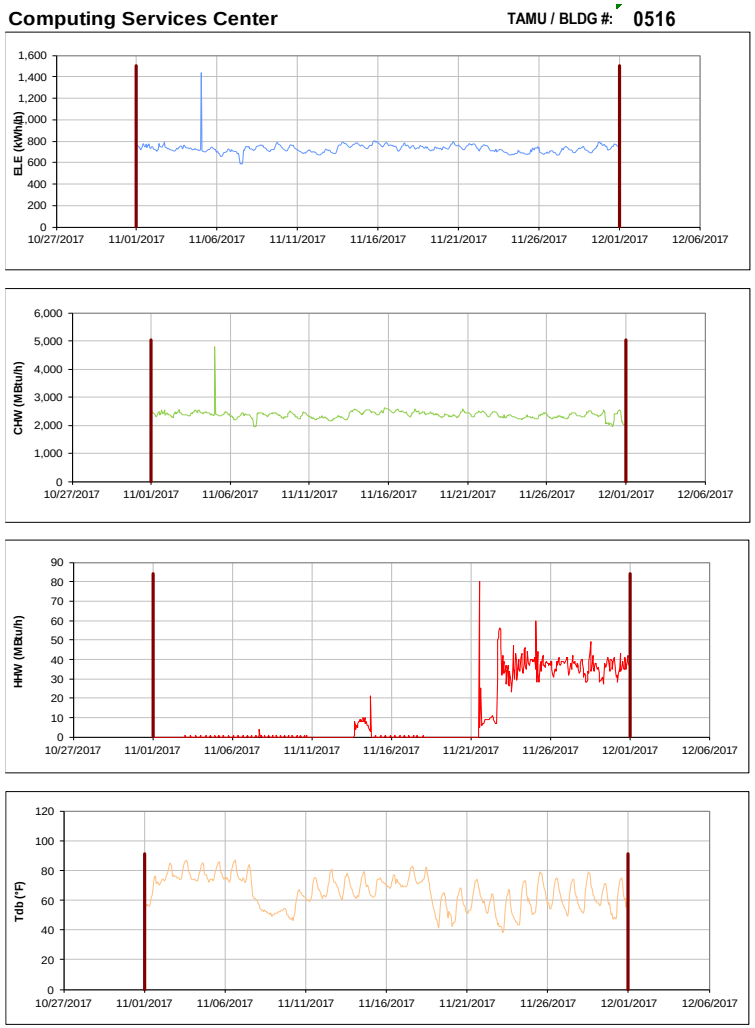


Figure III-116 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Computing Services Center during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

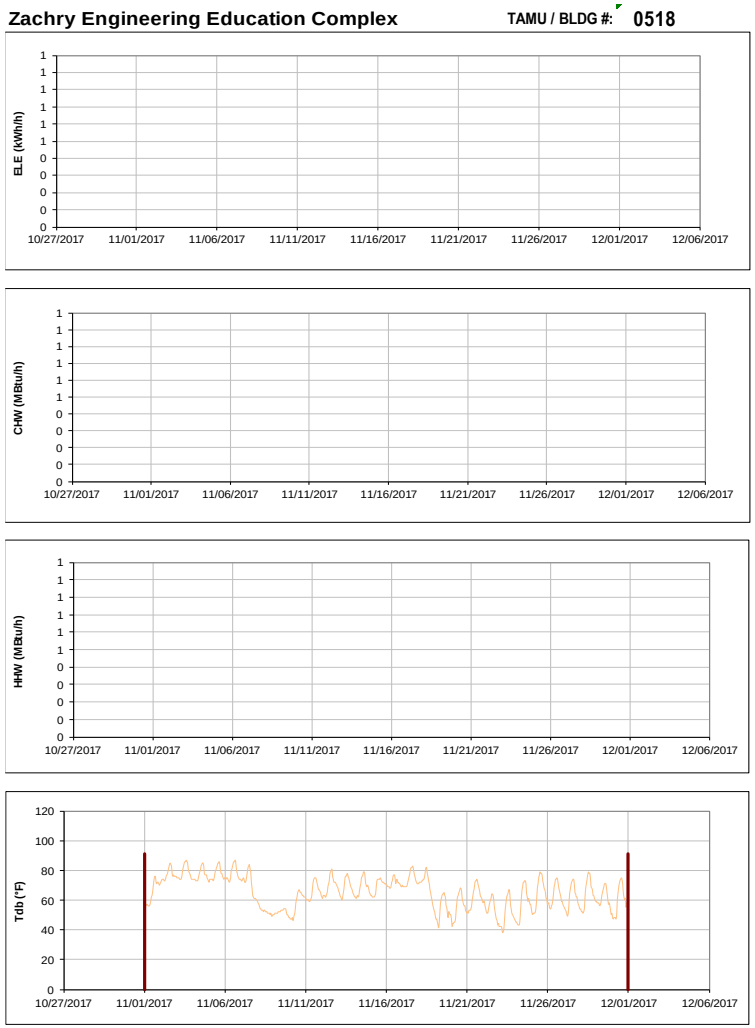


Figure III-117 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Zachry Engineering Education Complex during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

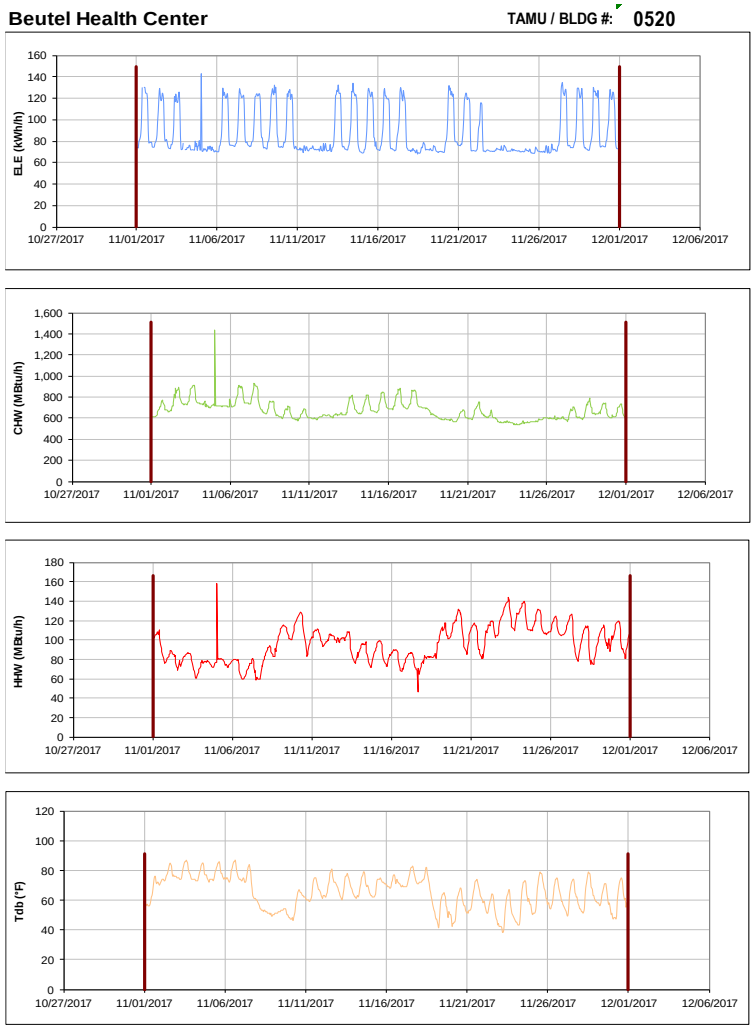


Figure III-118 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Beutel Health Center during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

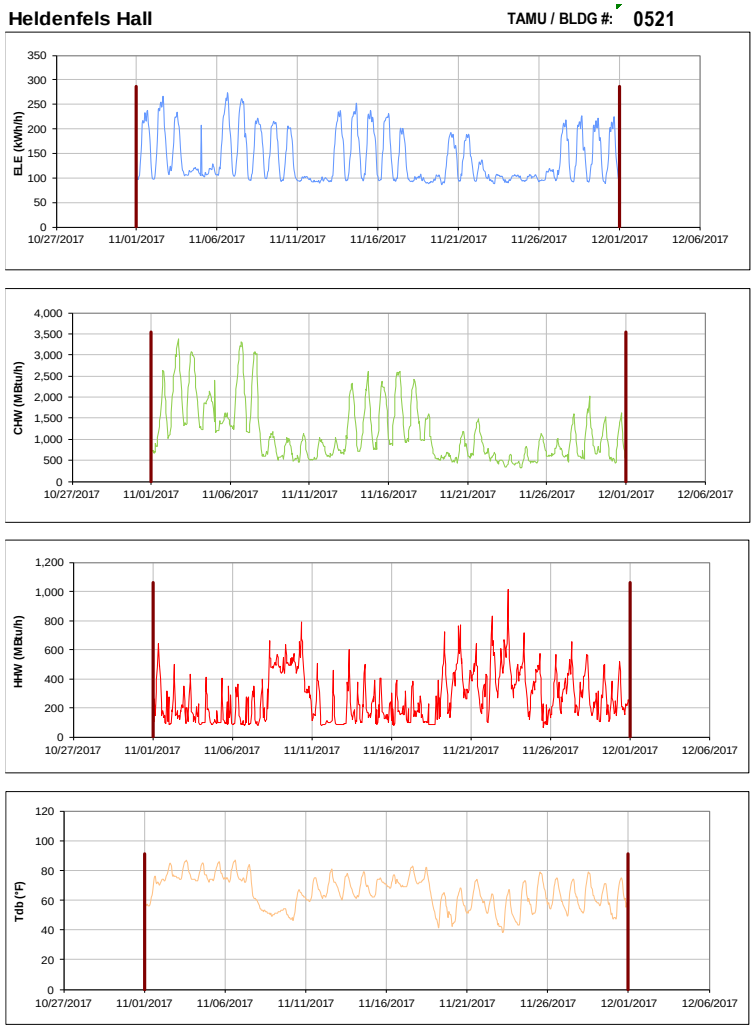


Figure III-119 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Heldenfels Hall during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-120 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Blocker building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

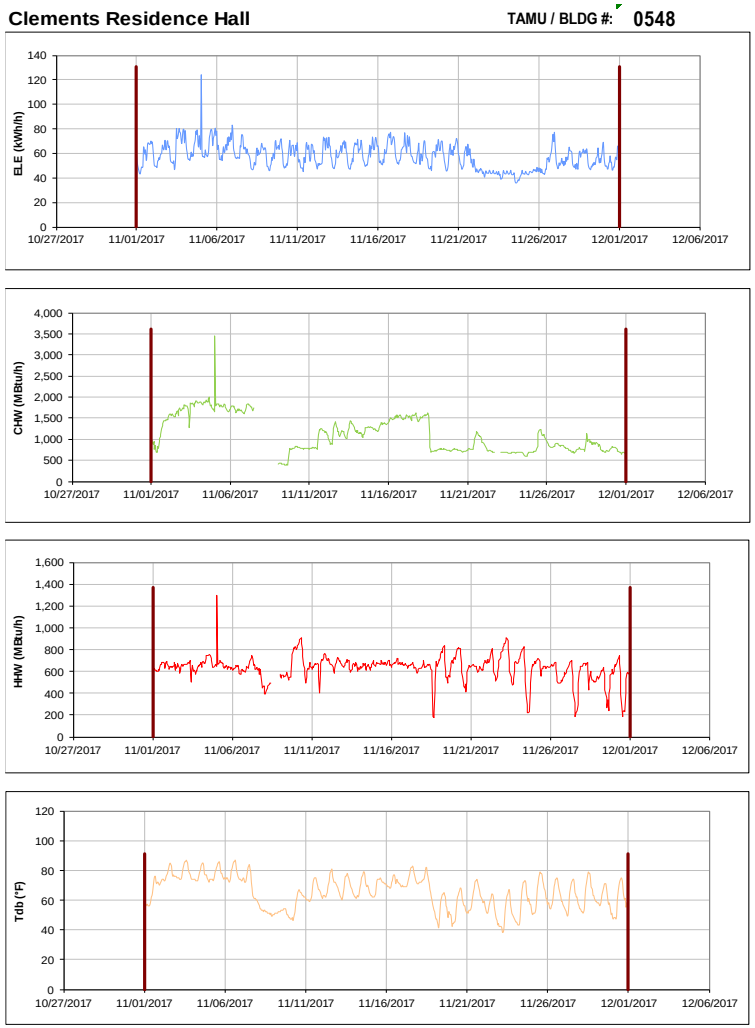


Figure III-121 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Clements Residence Hall during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

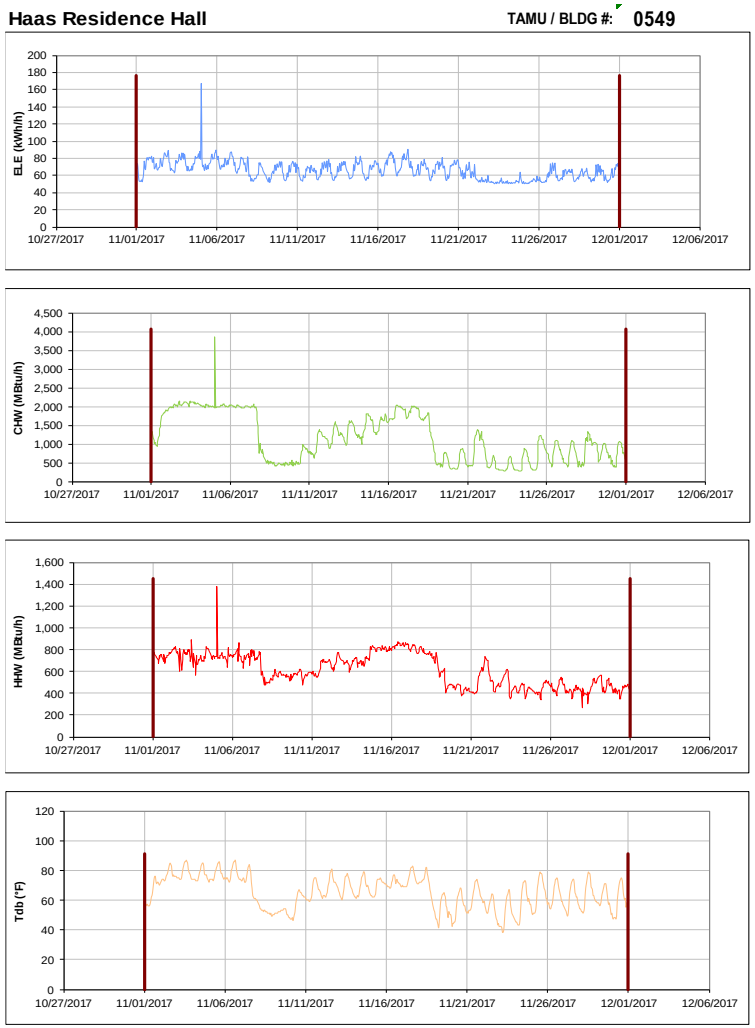


Figure III-122 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Haas Residence Hall during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

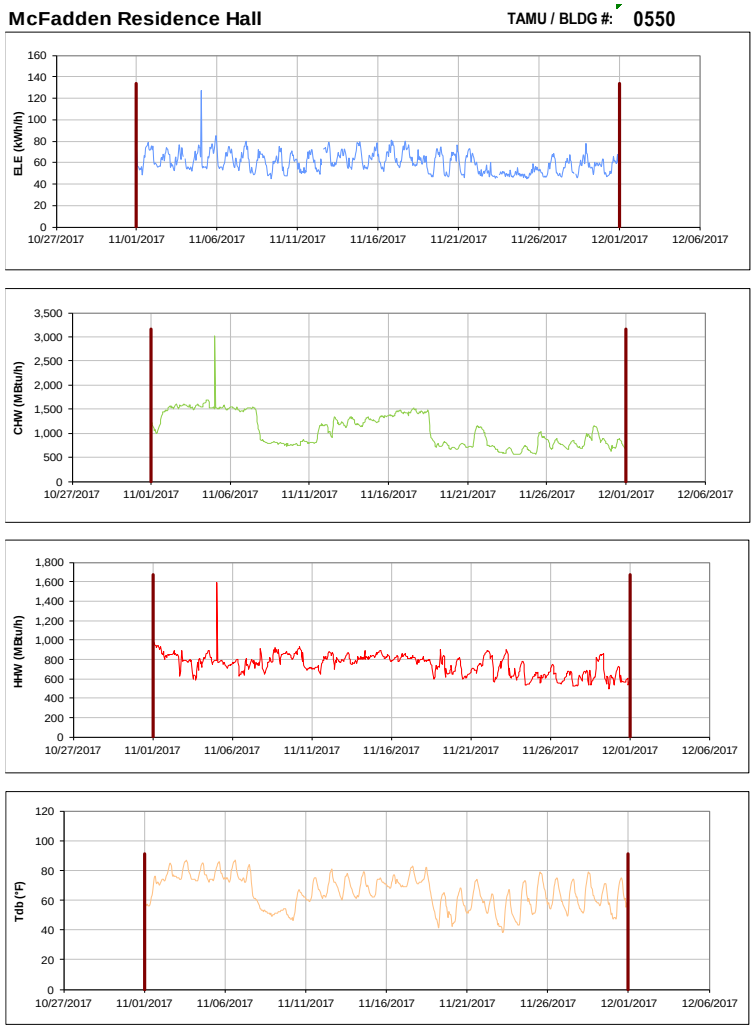


Figure III-123 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for McFadden Residence Hall during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

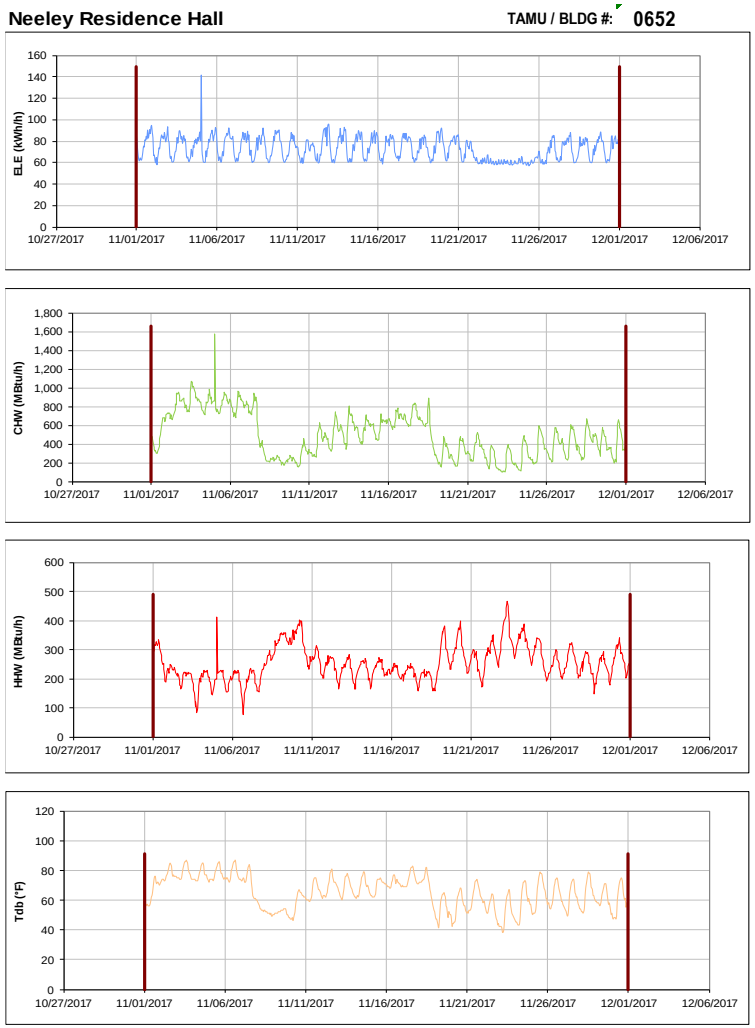


Figure III-124 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Neeley Residence Hall during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

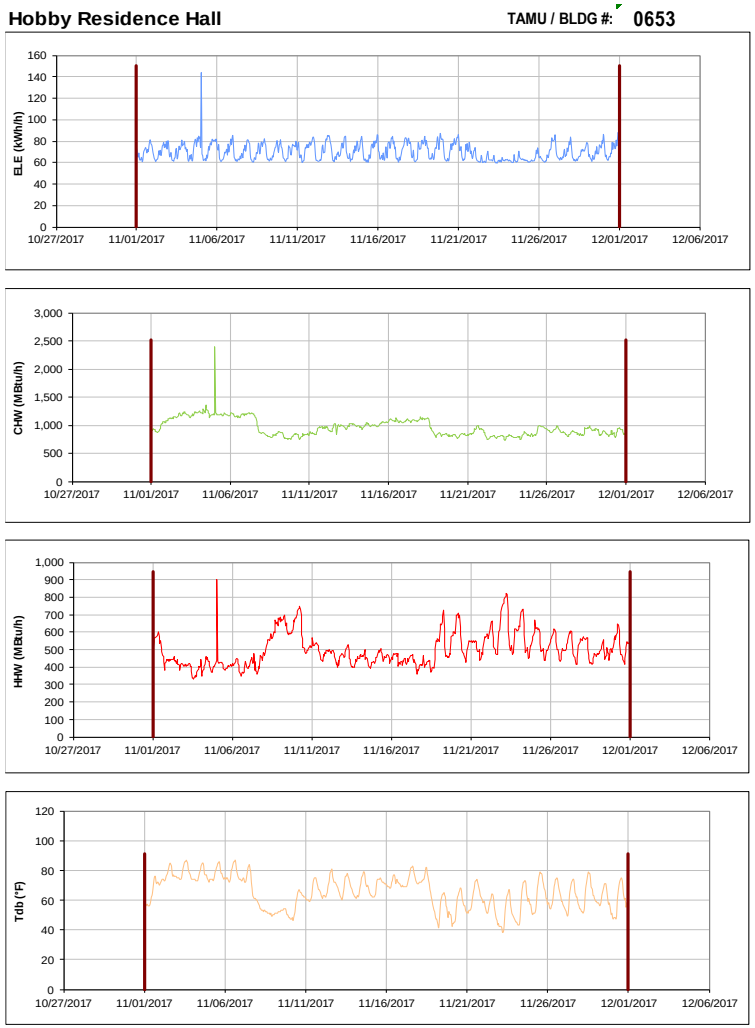


Figure III-125 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Hobby Residence Hall during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

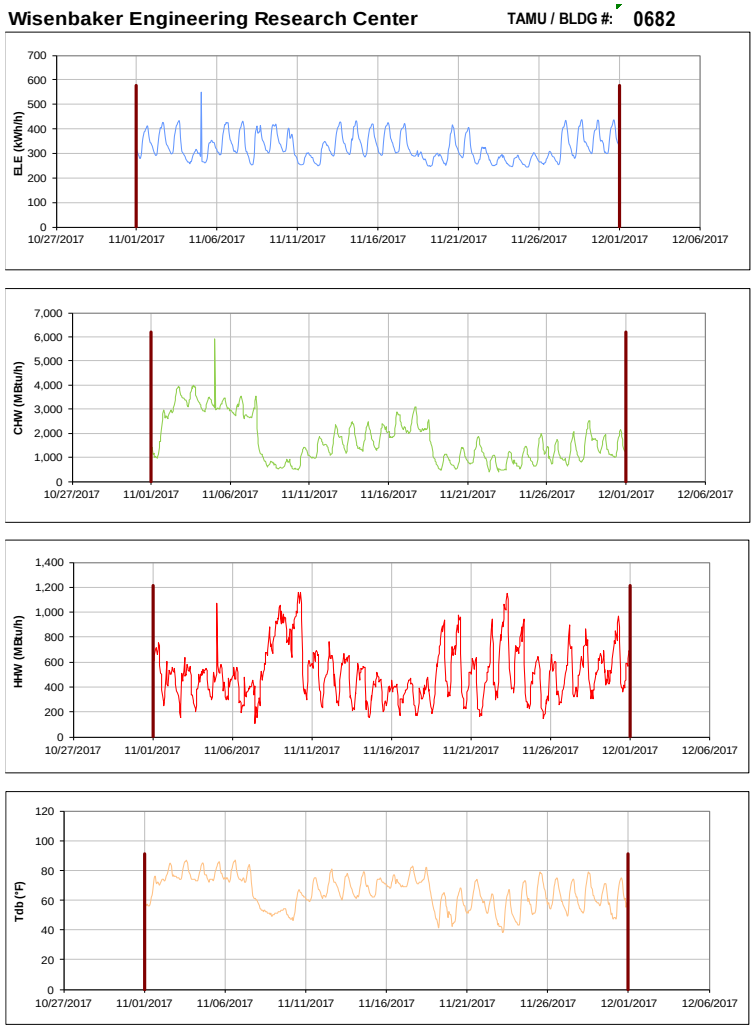


Figure III-126 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Wisenbaker Engineering Research Center during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-127 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for McNew Laboratory during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

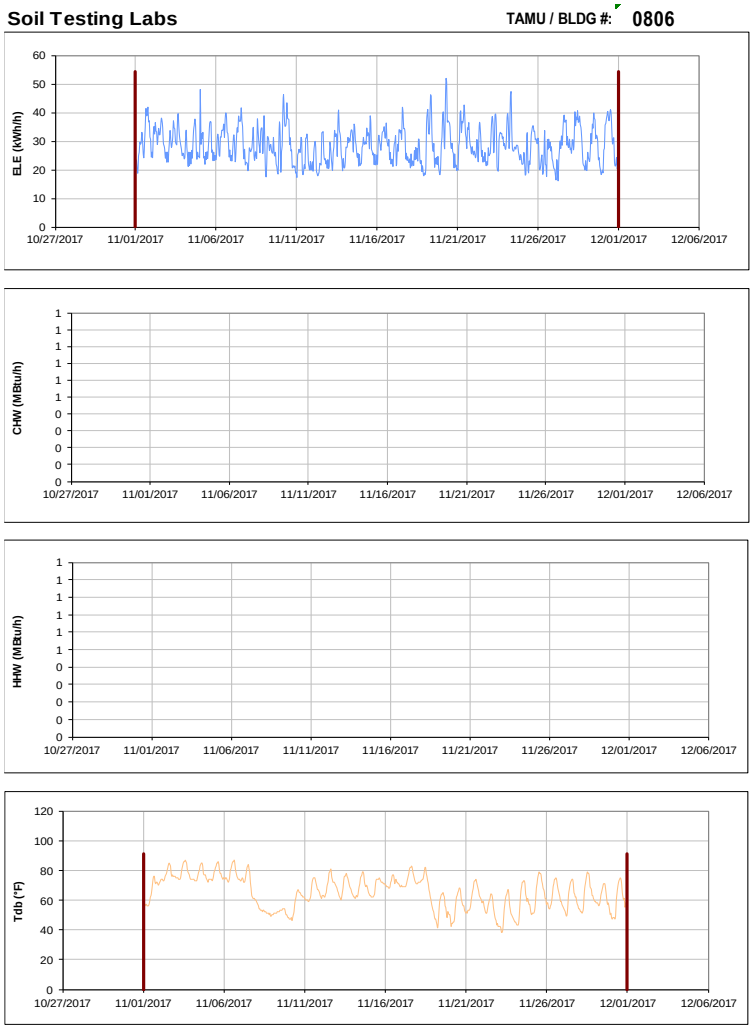


Figure III-128 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Soil Testing Labs during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-129 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Entomology Research Lab during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-130 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for TVMC-Small Animal Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

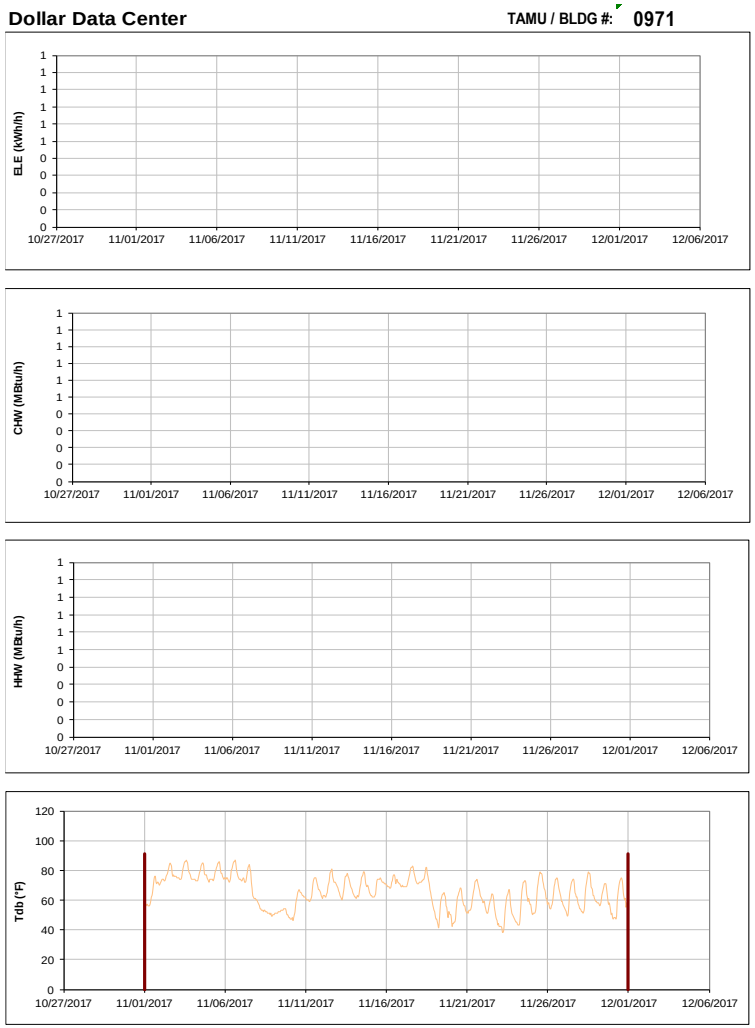


Figure III-131 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Dollar Data Center during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-132 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Laboratory Animal Care Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

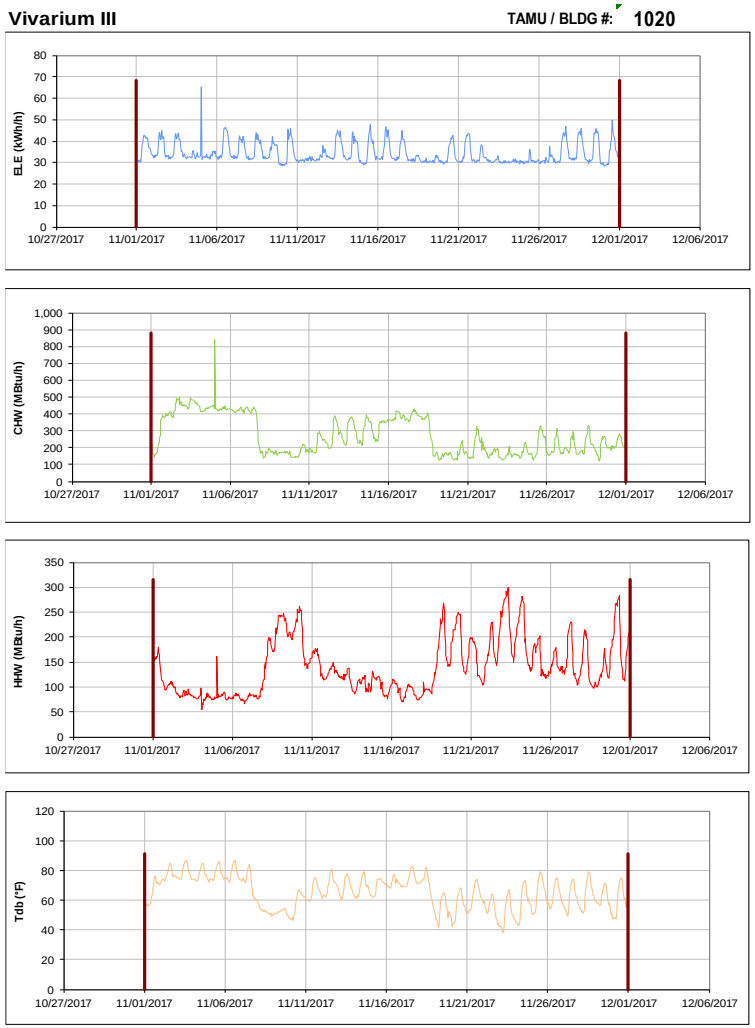


Figure III-133 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Vivarium III during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

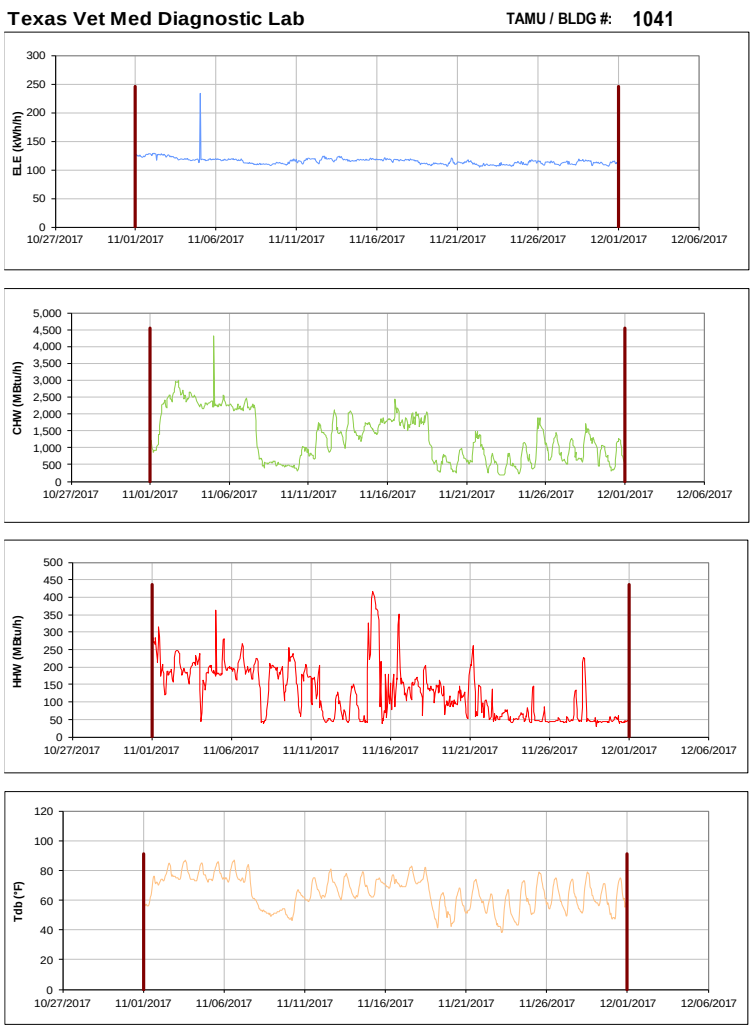


Figure III-134 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Texas Vet Med Diagnostic Lab during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

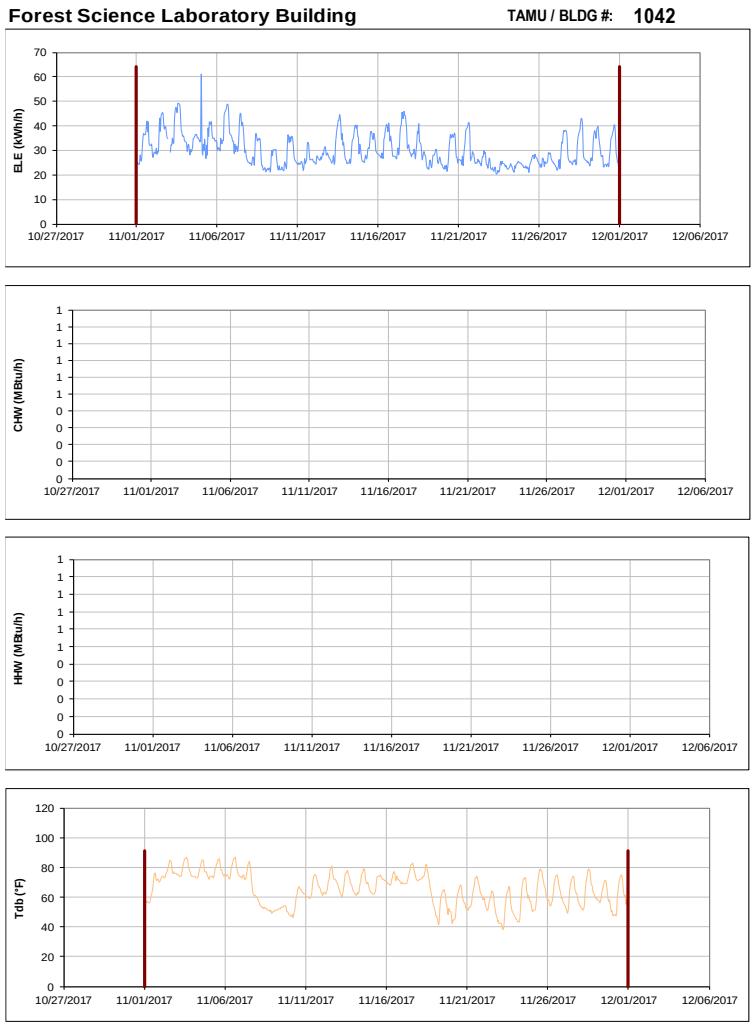


Figure III-135 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Forest Science Laboratory Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-136 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Veterinary Small Animal Hospital during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

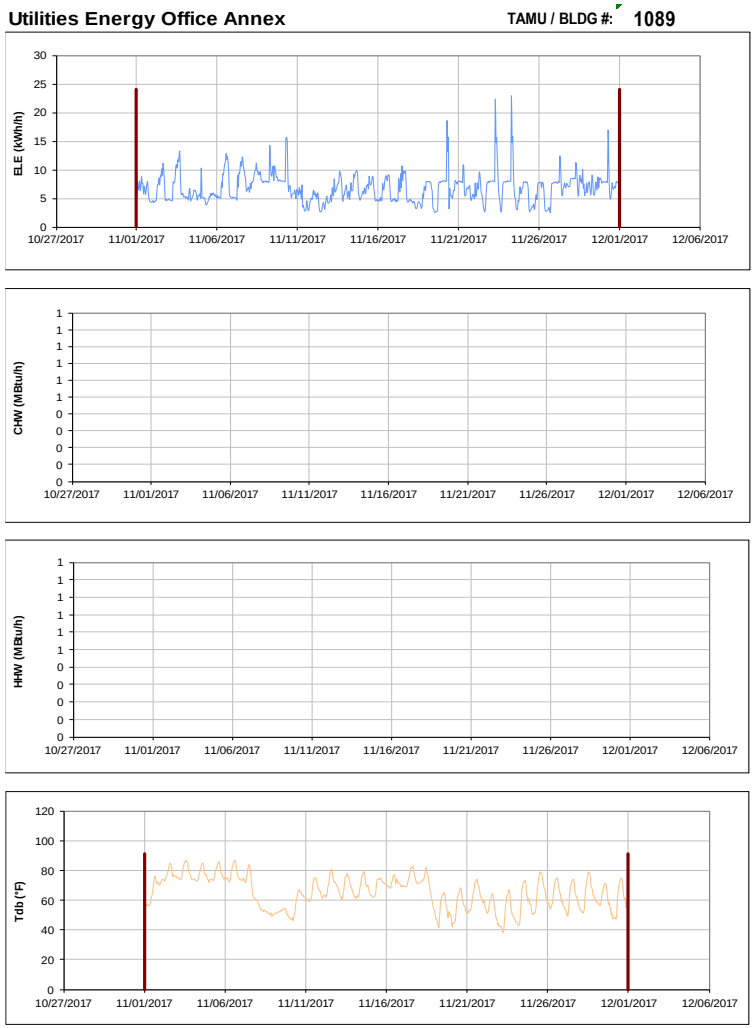


Figure III-137 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Utilities Energy Office Annex during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

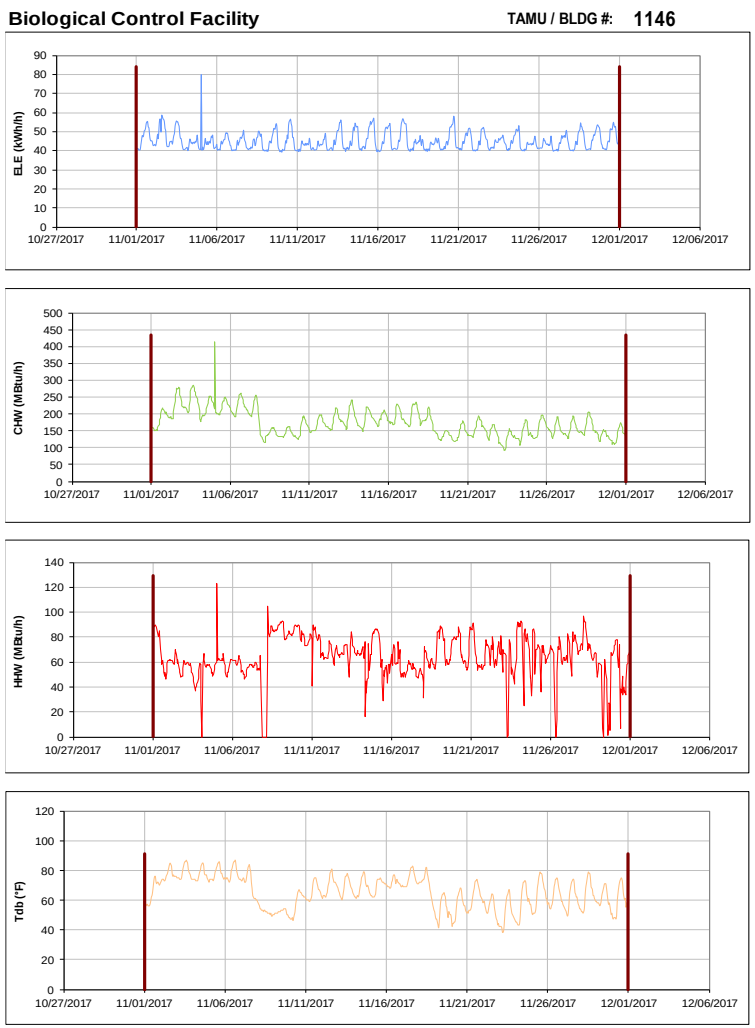


Figure III-138 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Biological Control Facility during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

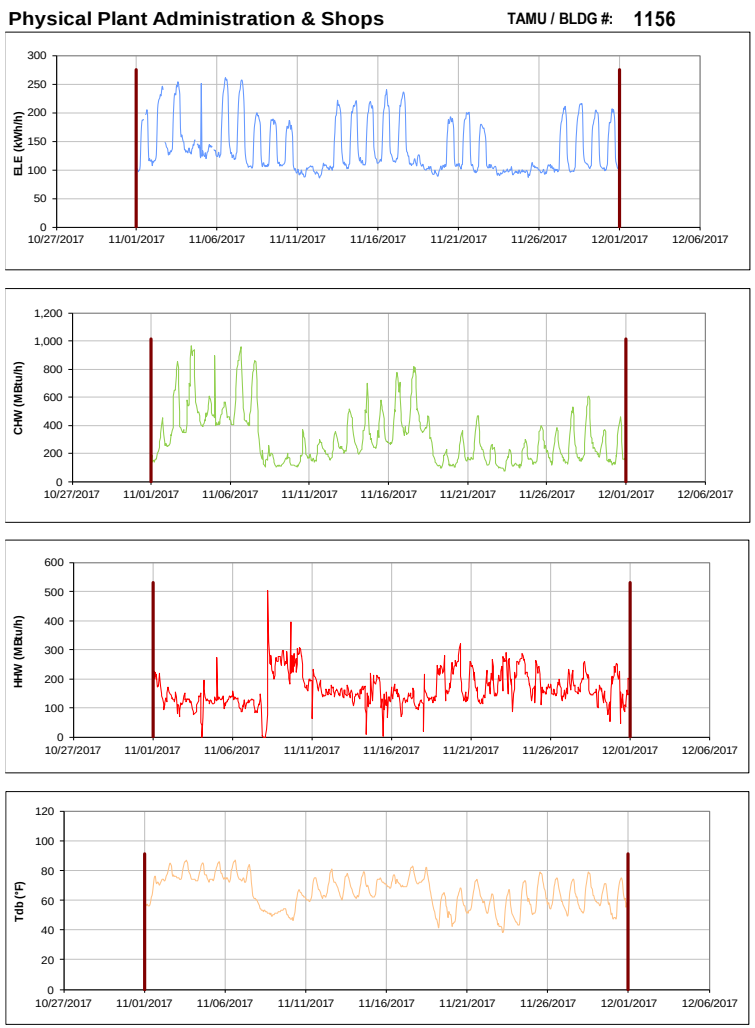


Figure III-139 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Physical Plant Administration & Shops during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

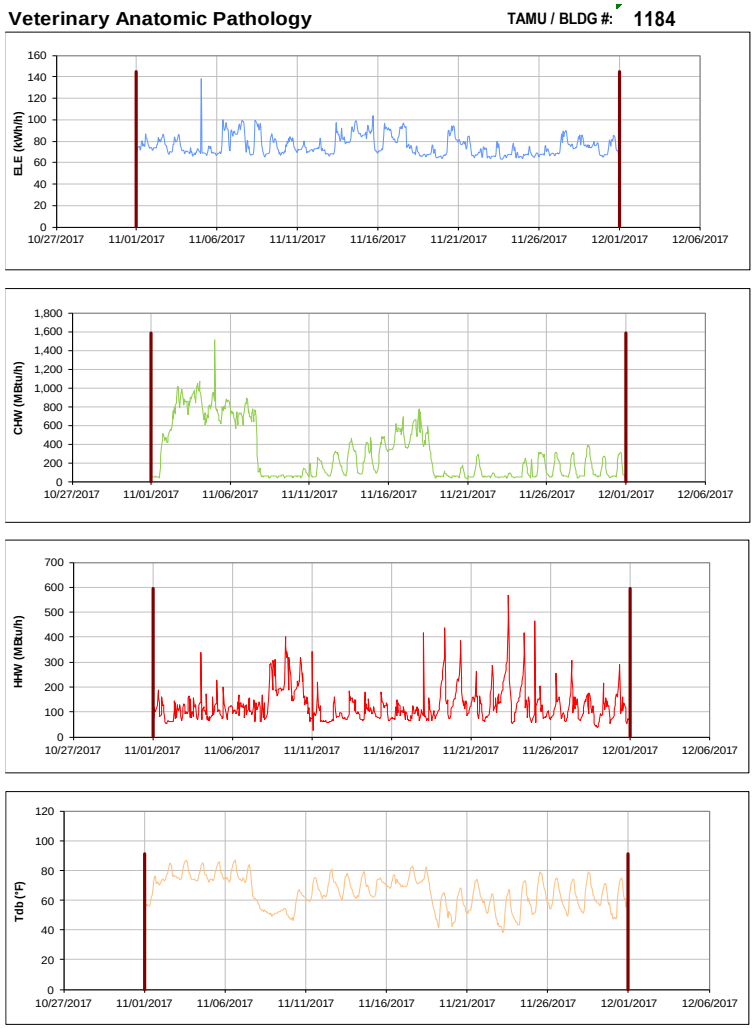


Figure III-140 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Veterinary Anatomic Pathology during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

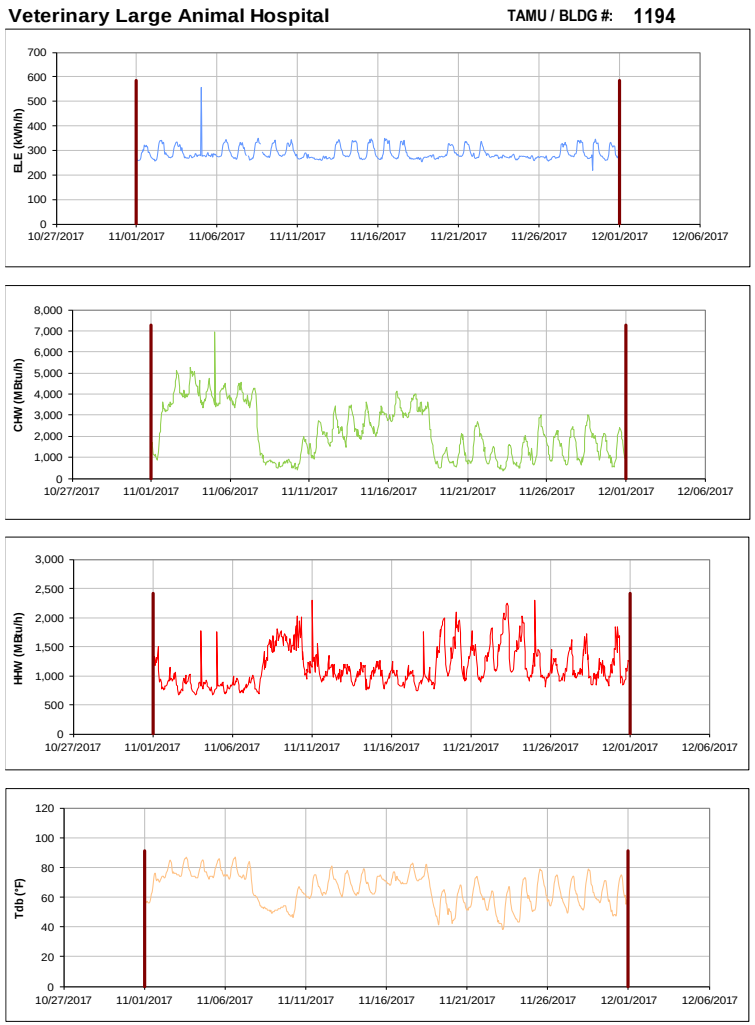


Figure III-141 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Veterinary Large Animal Hospital during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

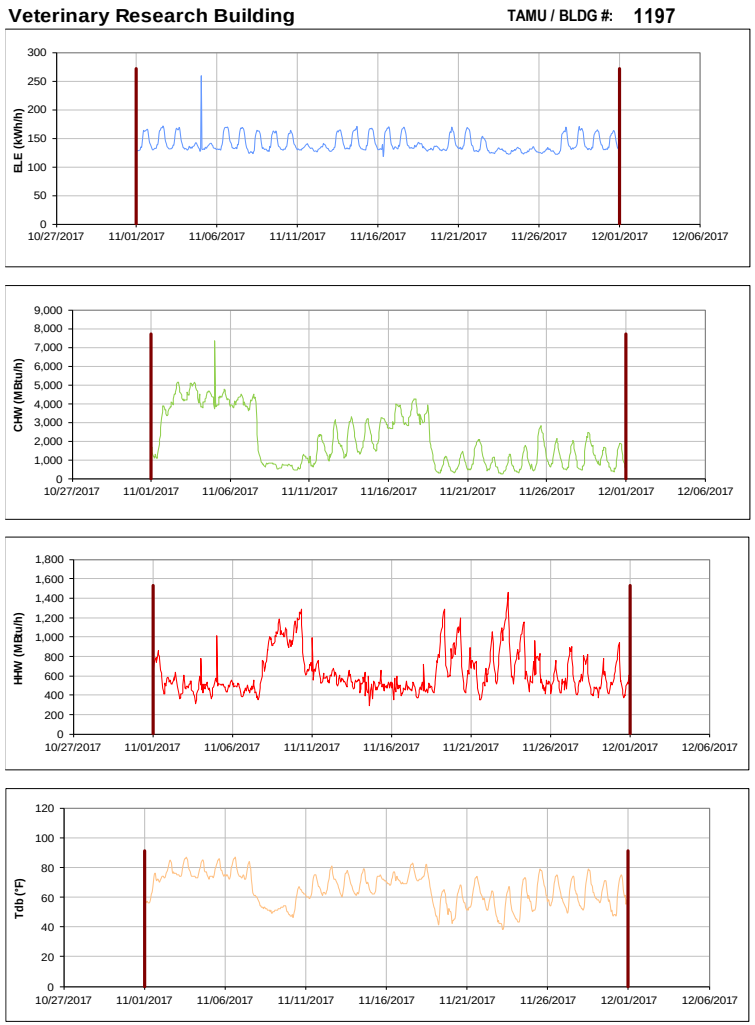


Figure III-142 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Veterinary Research Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

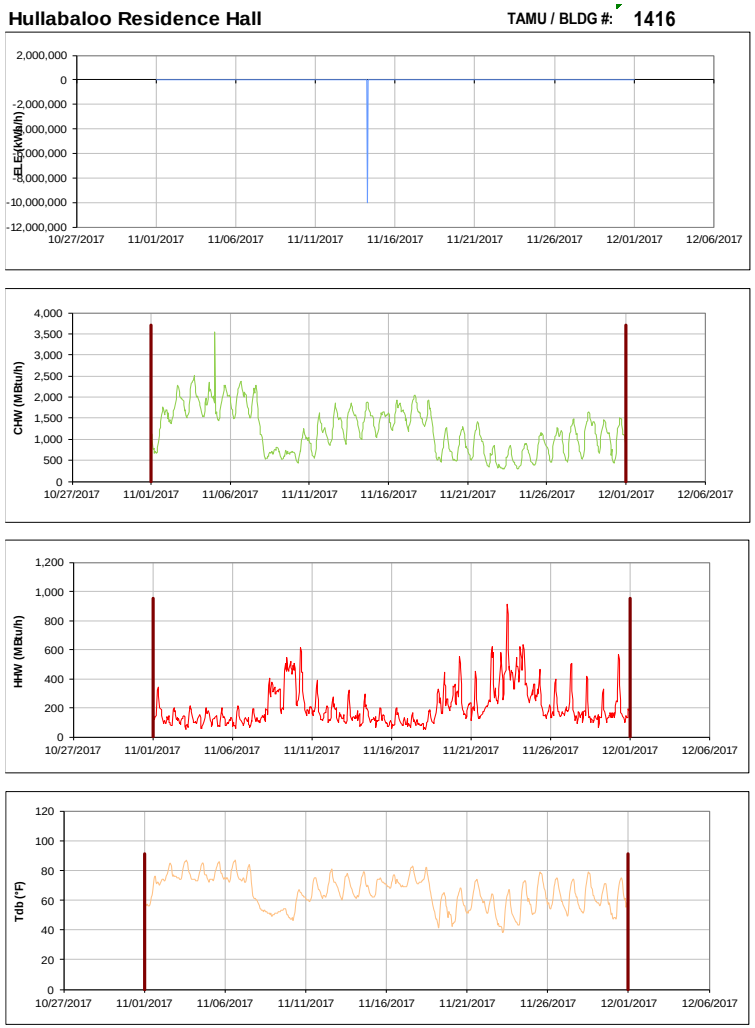


Figure III-143 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Hullabaloo Residence Hall during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

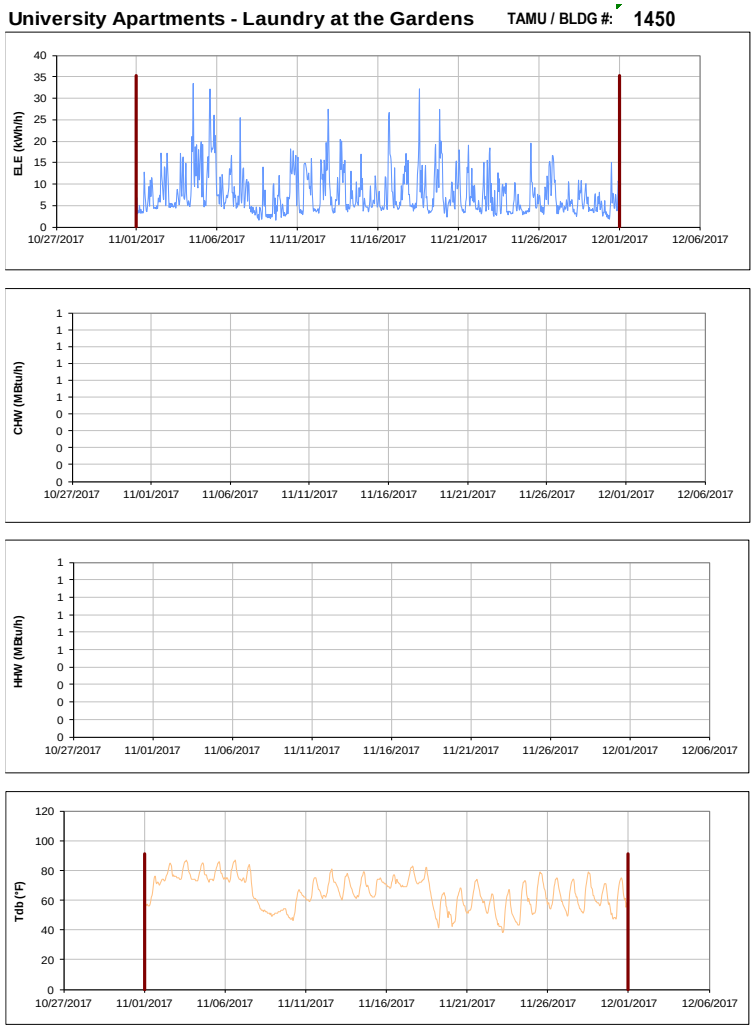


Figure III-144 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for University Apartments - Laundry at the Gardens during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

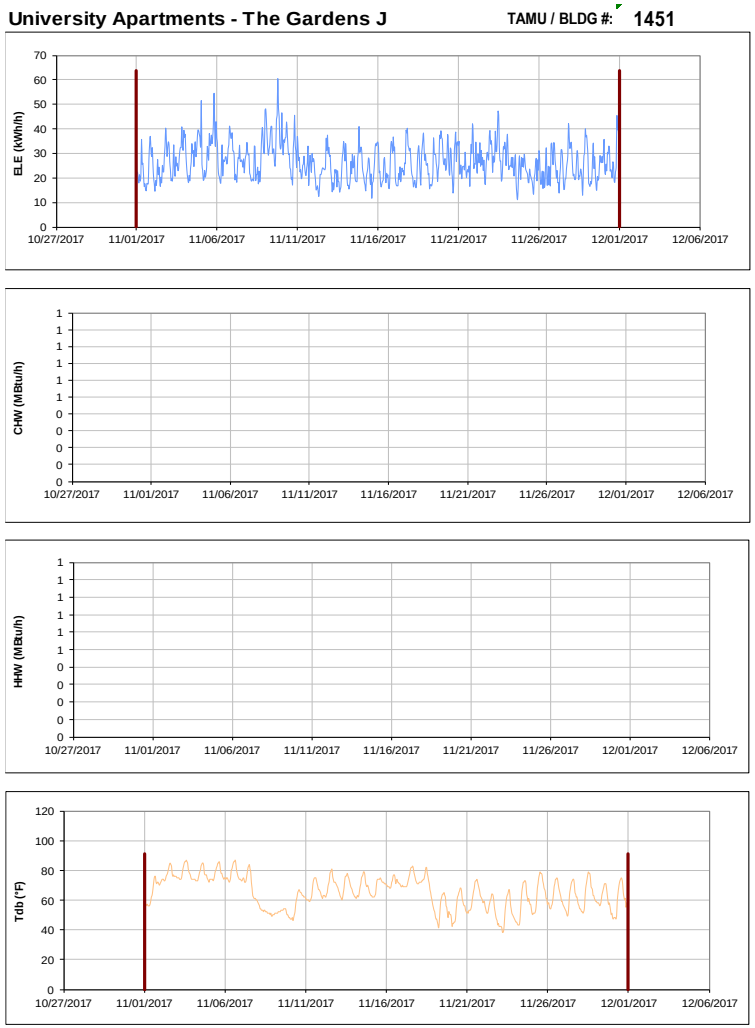


Figure III-145 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for University Apartments - The Gardens J during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

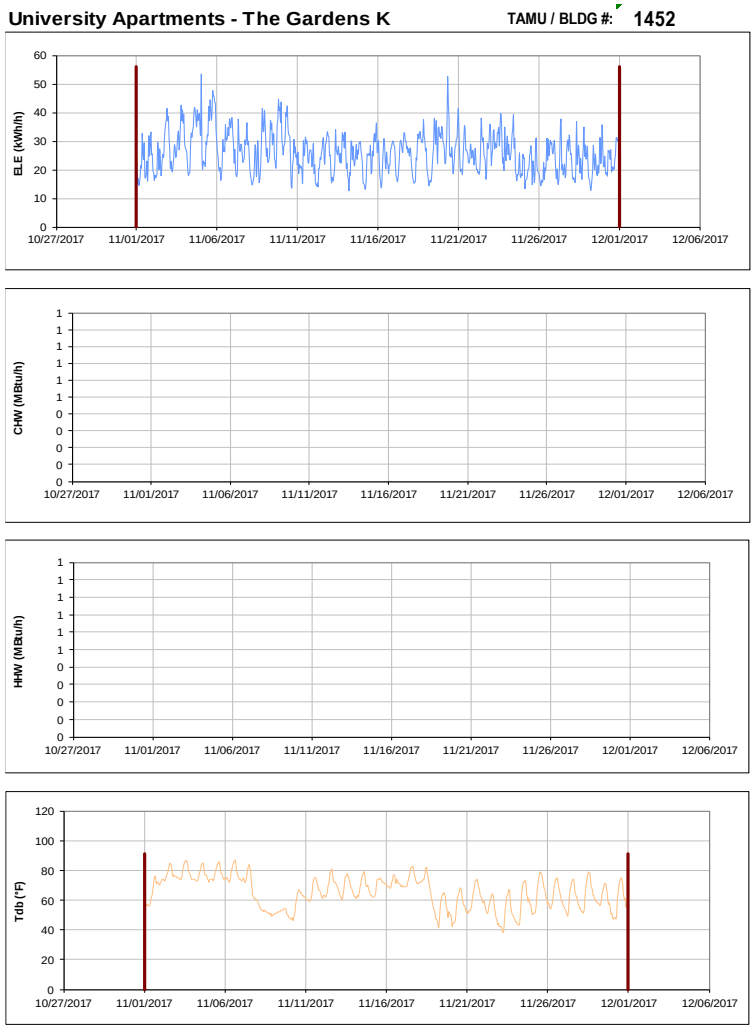


Figure III-146 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for University Apartments - The Gardens K during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

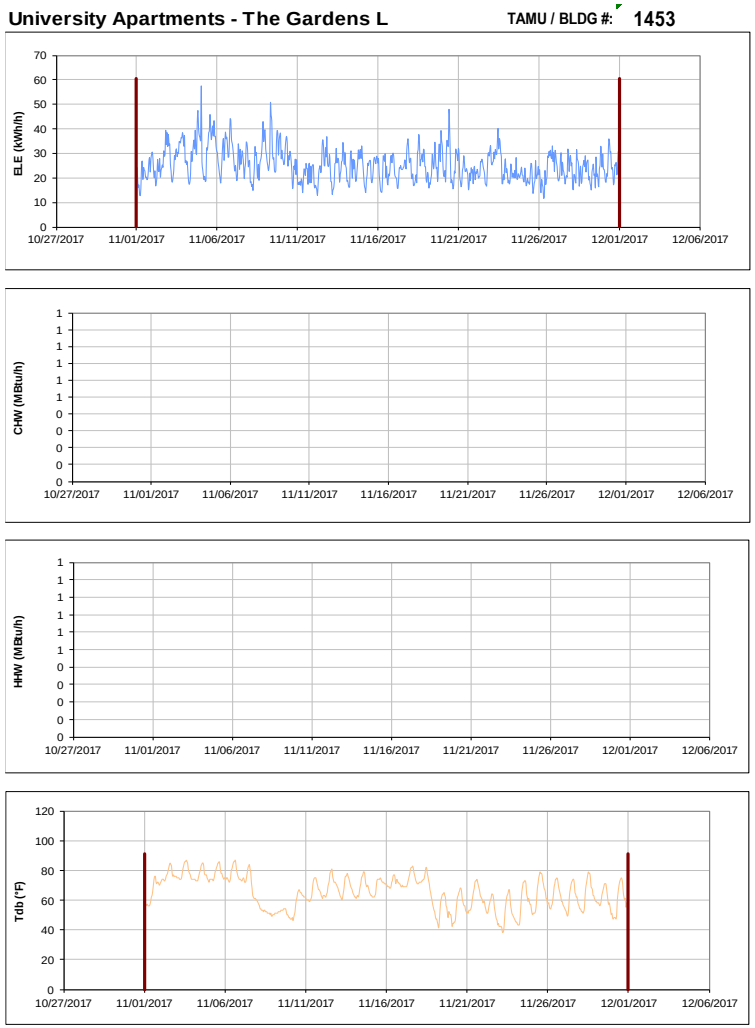


Figure III-147 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for University Apartments - The Gardens L during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

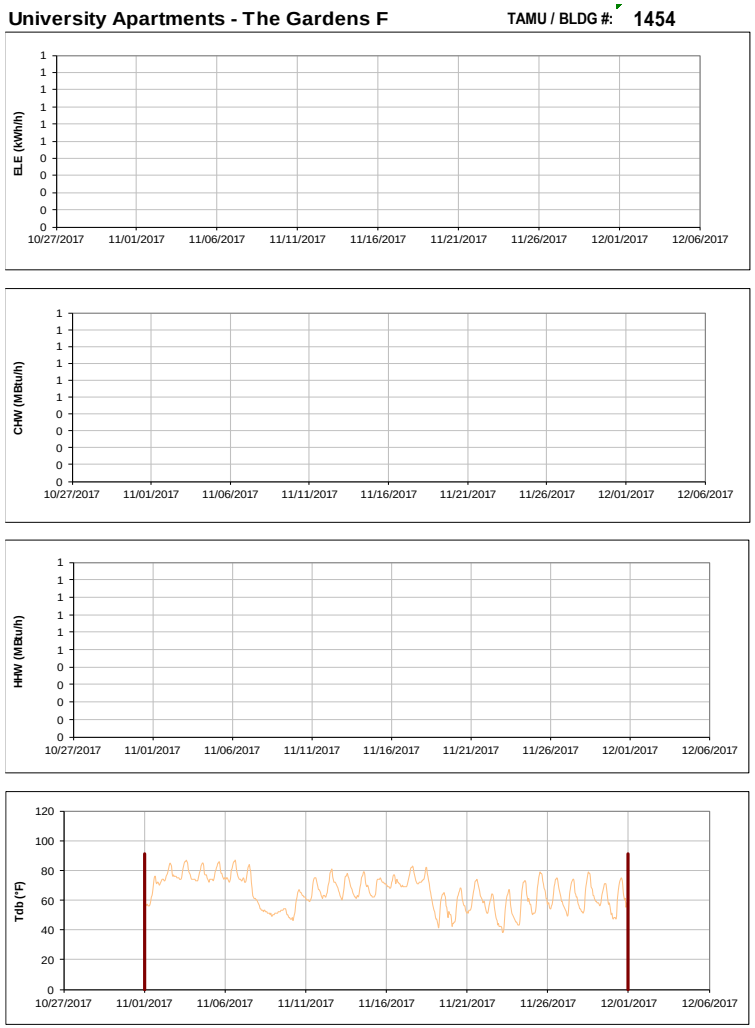


Figure III-148 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for University Apartments - The Gardens F during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

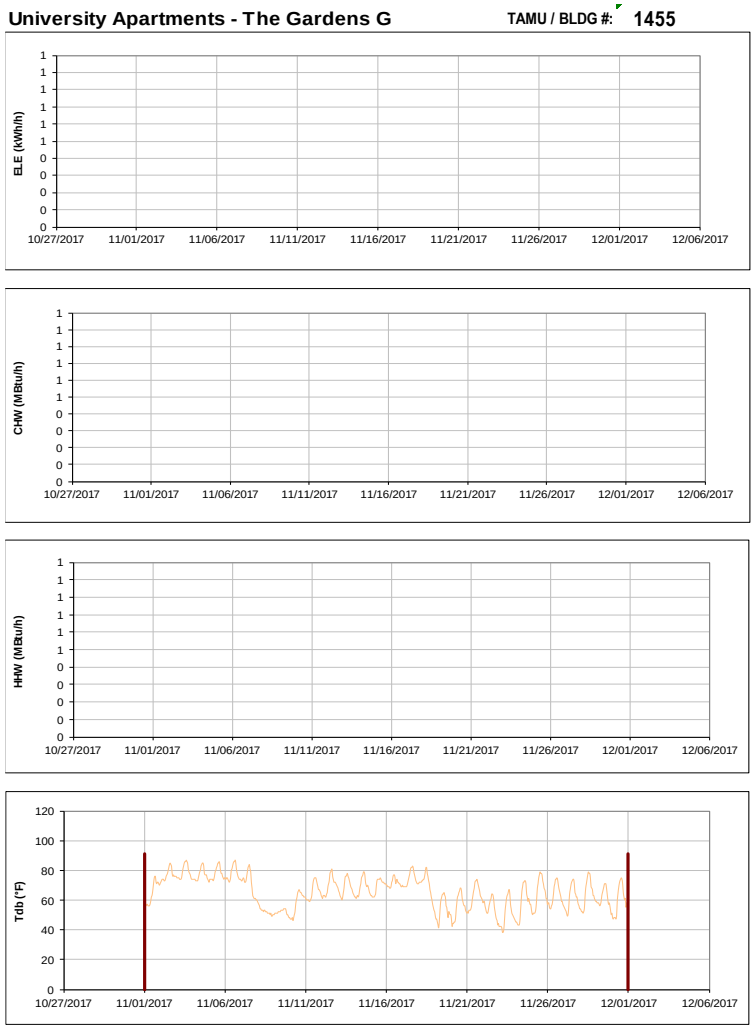


Figure III-149 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for University Apartments - The Gardens G during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

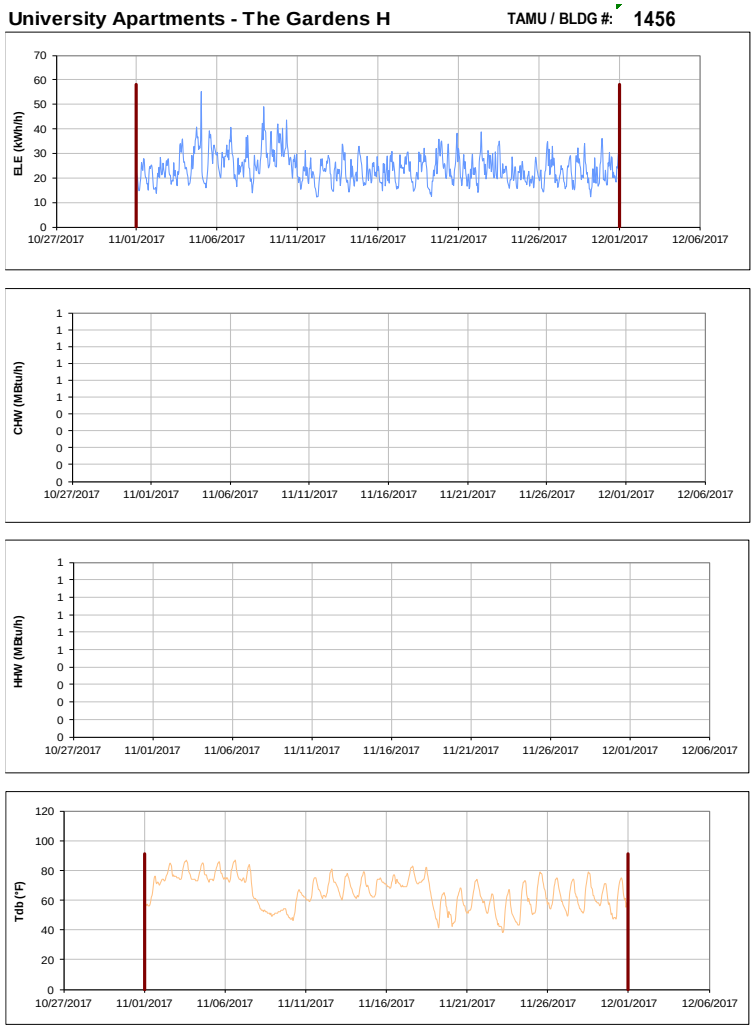


Figure III-150 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for University Apartments - The Gardens H during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

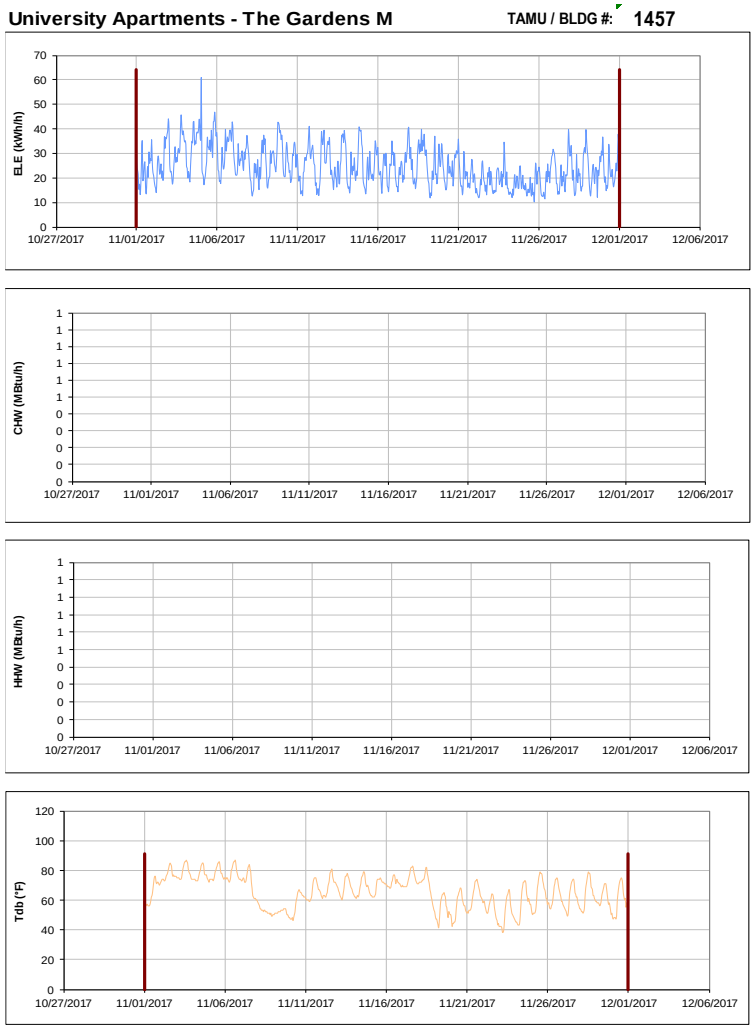


Figure III-151 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for University Apartments - The Gardens M during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

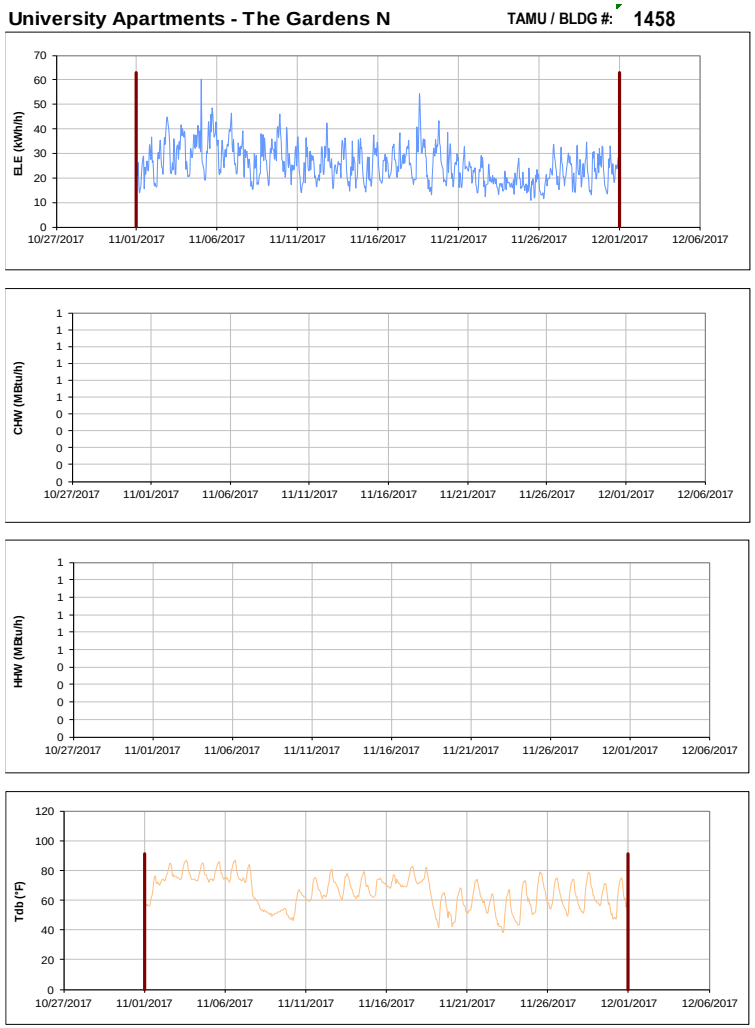


Figure III-152 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for University Apartments - The Gardens N during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

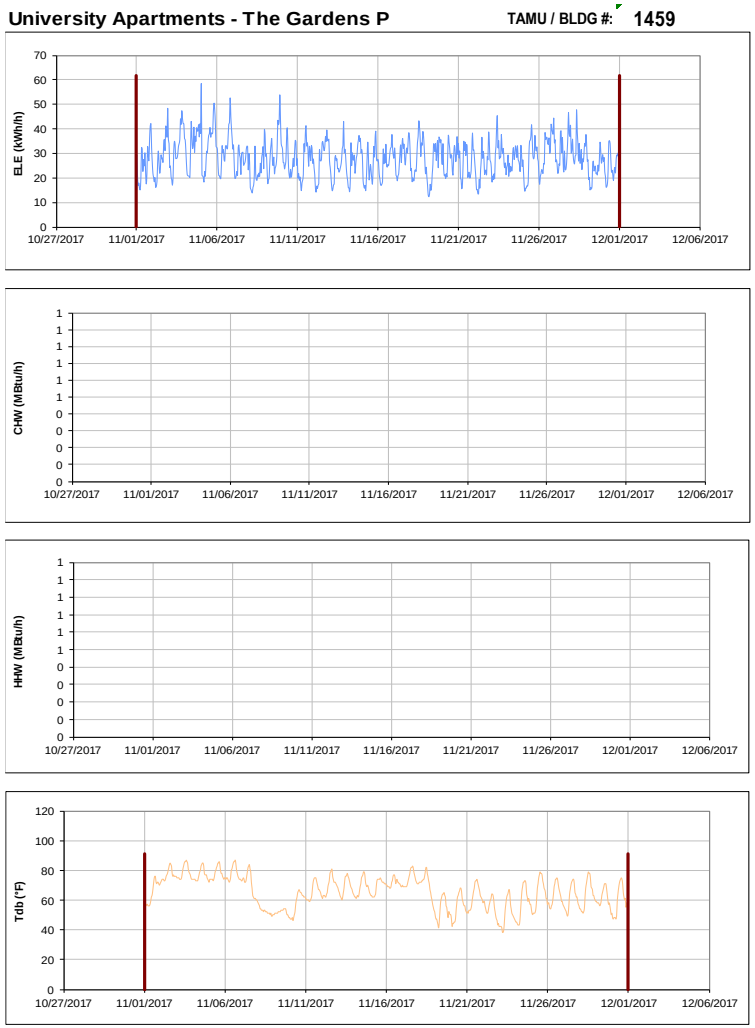


Figure III-153 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for University Apartments - The Gardens P during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

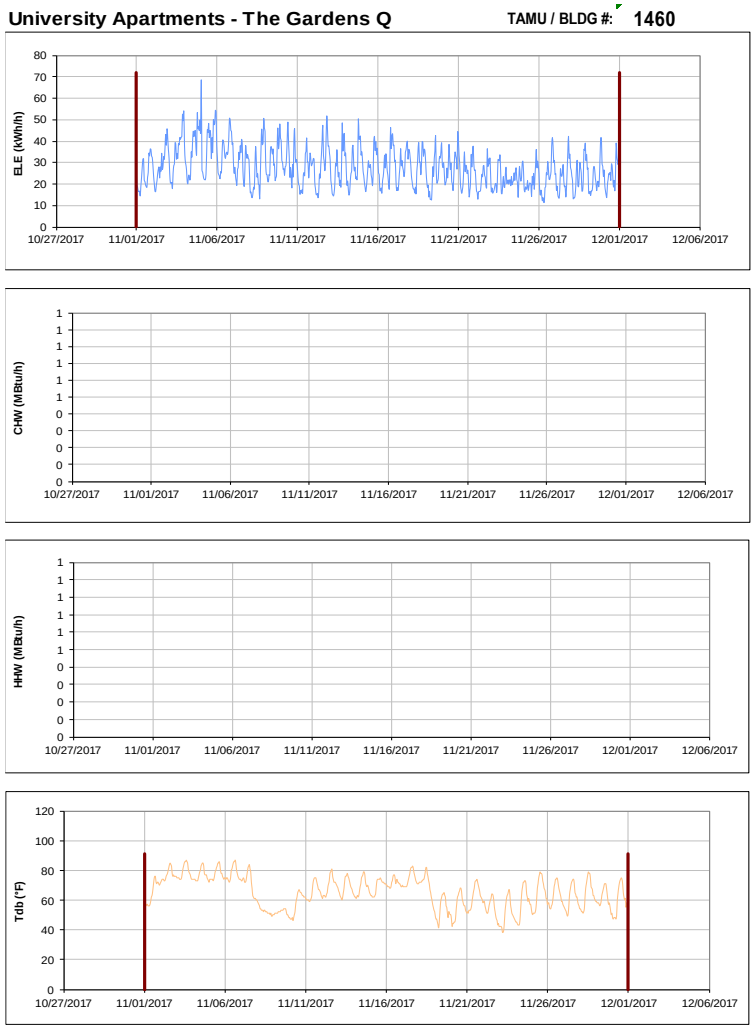


Figure III-154 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for University Apartments - The Gardens Q during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-155 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Utilities & Energy Services Business Office during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

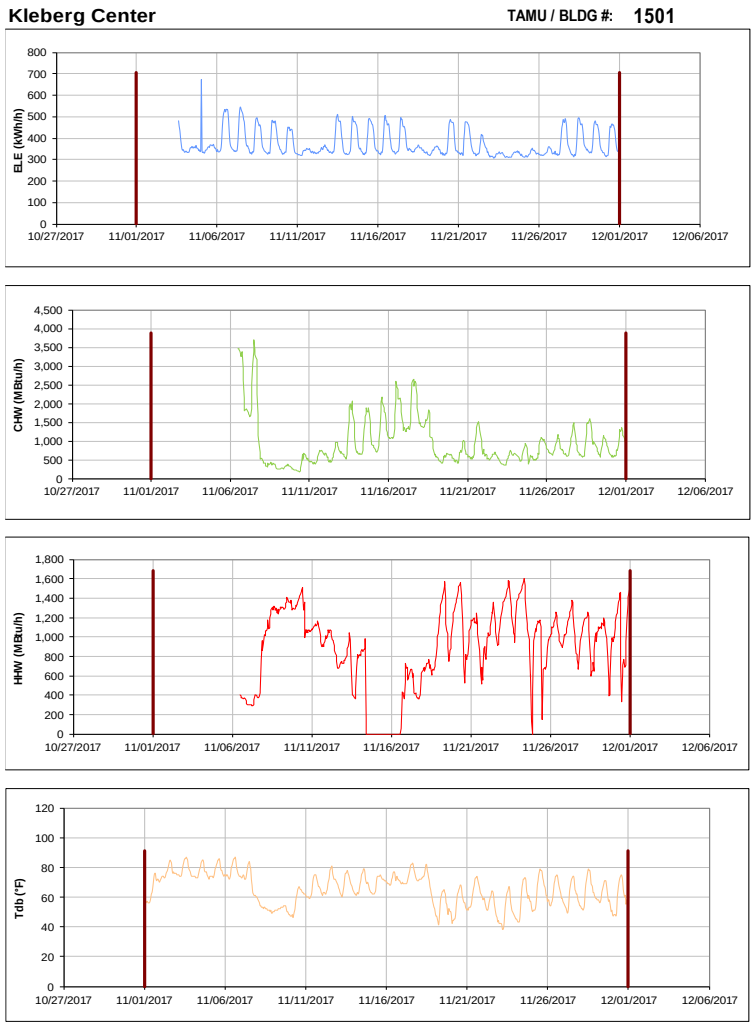


Figure III-156 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Kleberg Center during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

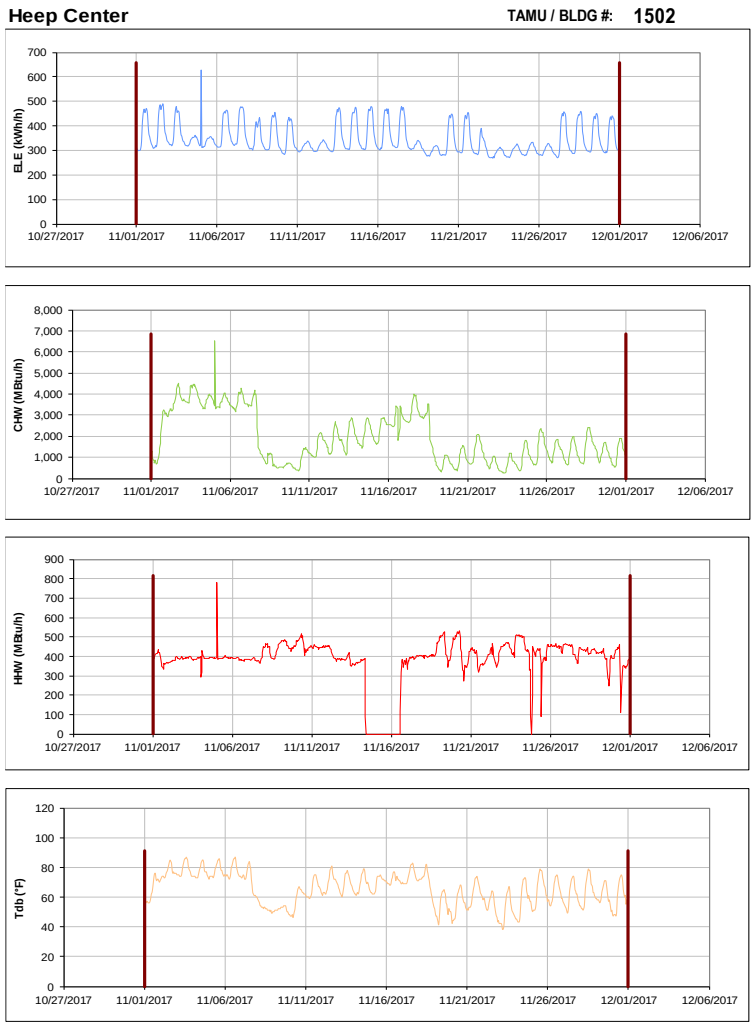


Figure III-157 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Heep Center during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

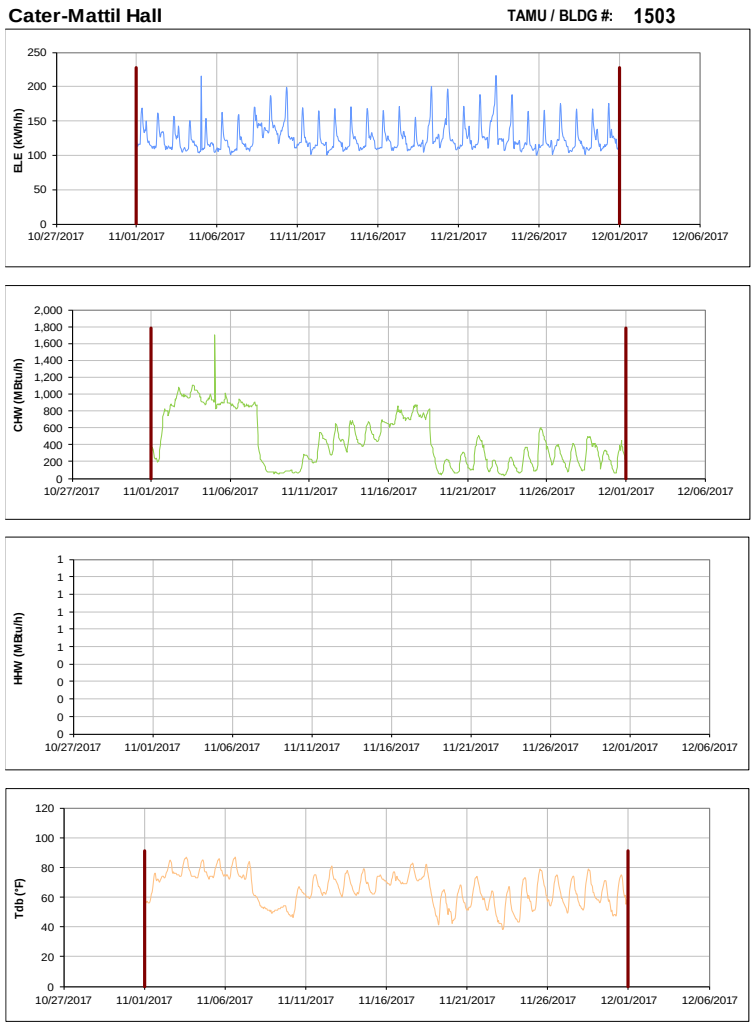


Figure III-158 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Cater-Mattil Hall during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

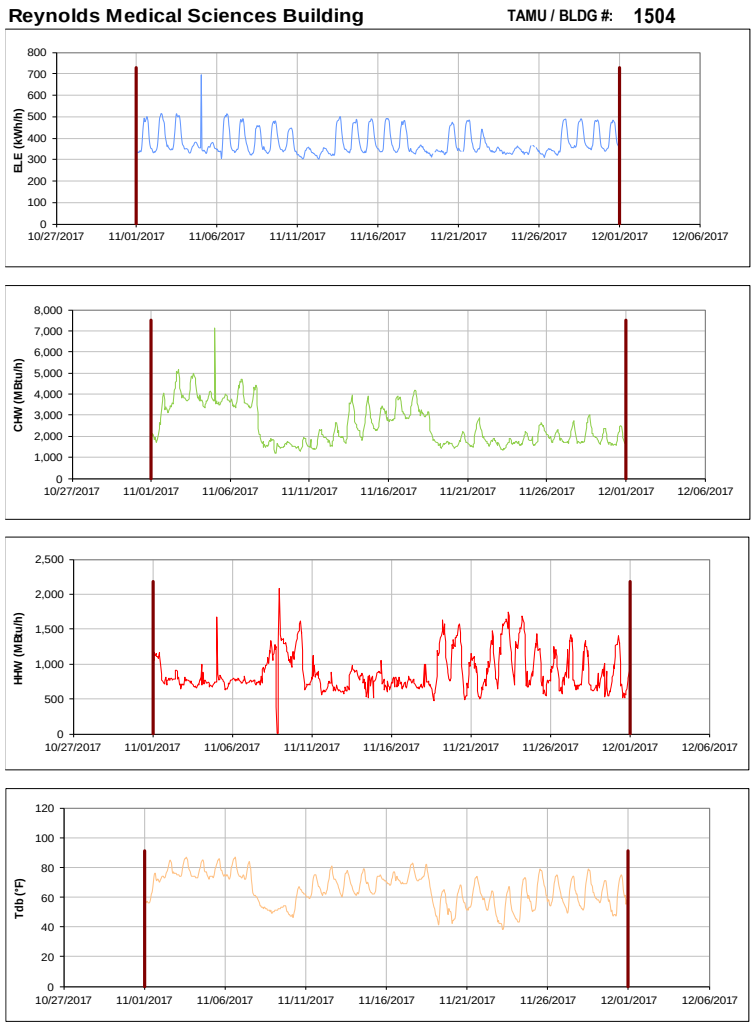


Figure III-159 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Reynolds Medical Sciences Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

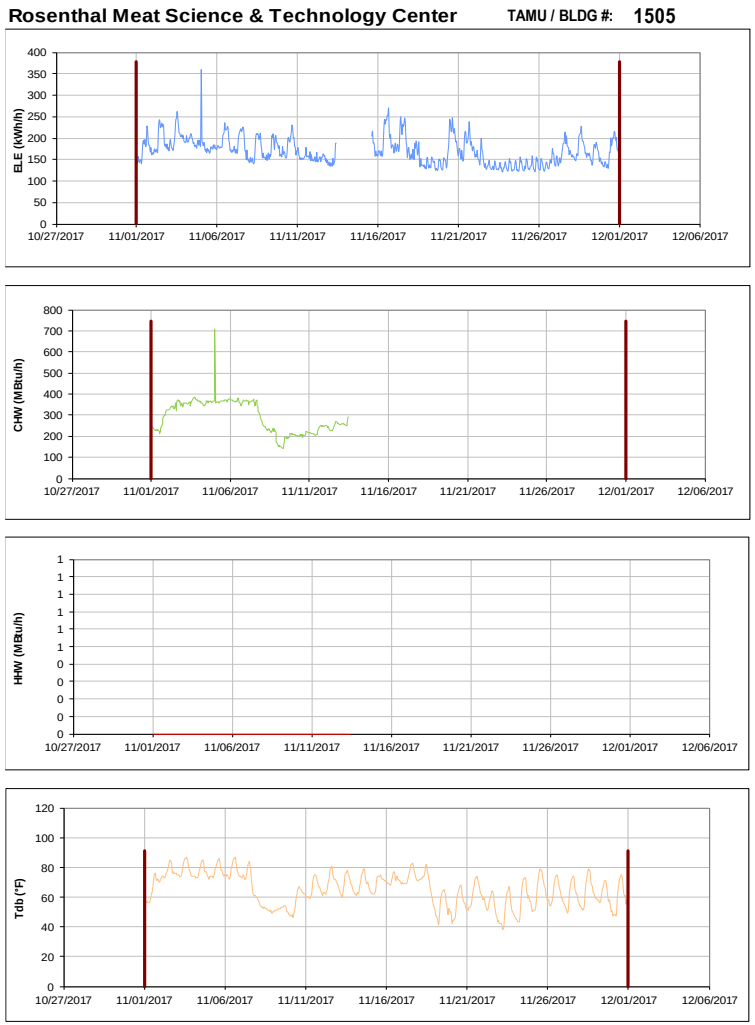


Figure III-160 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Rosenthal Meat Science & Technology Center during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

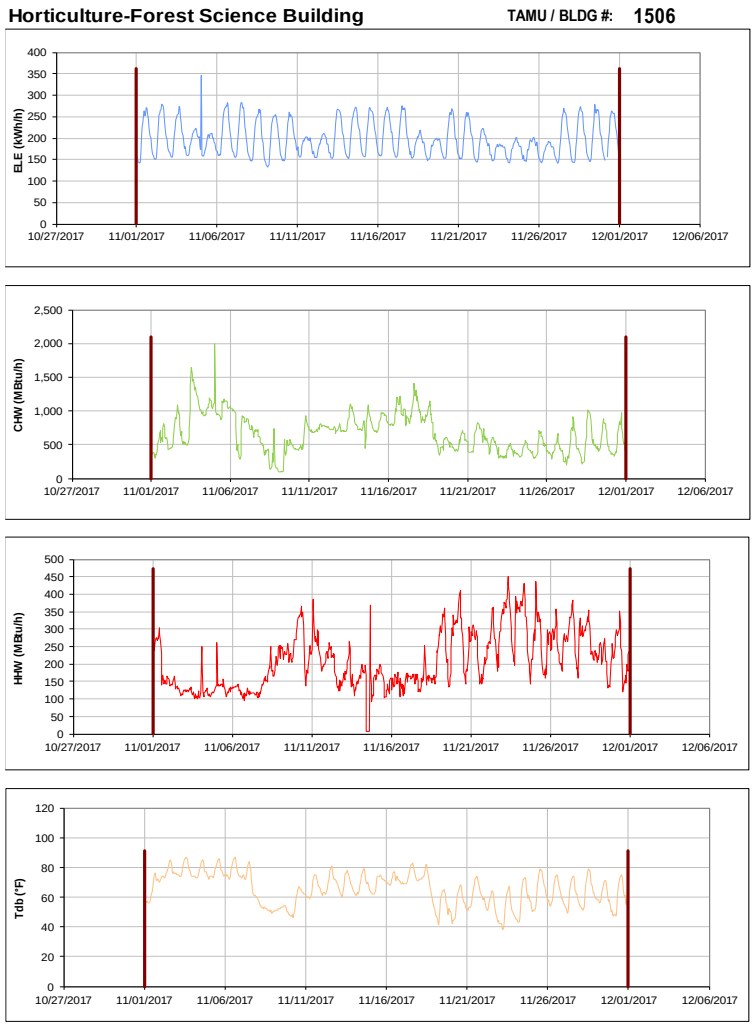


Figure III-161 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Horticulture-Forest Science Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-162 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Biochemistry-Biophysics Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

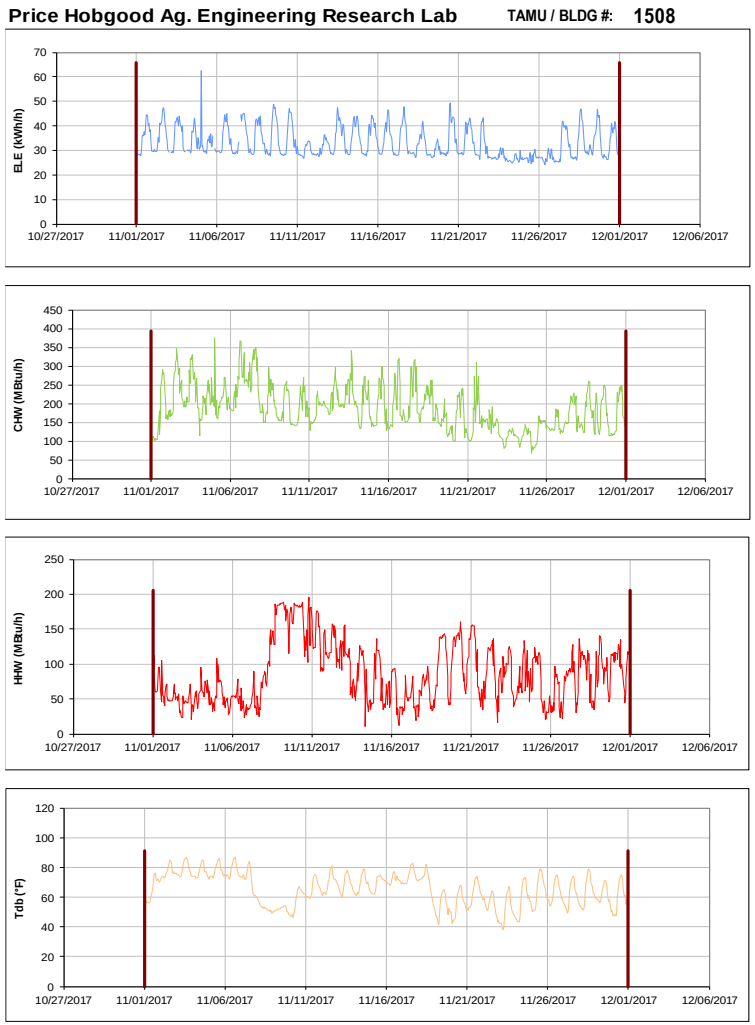


Figure III-163 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Price Hobgood Ag. Engineering Research Lab during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

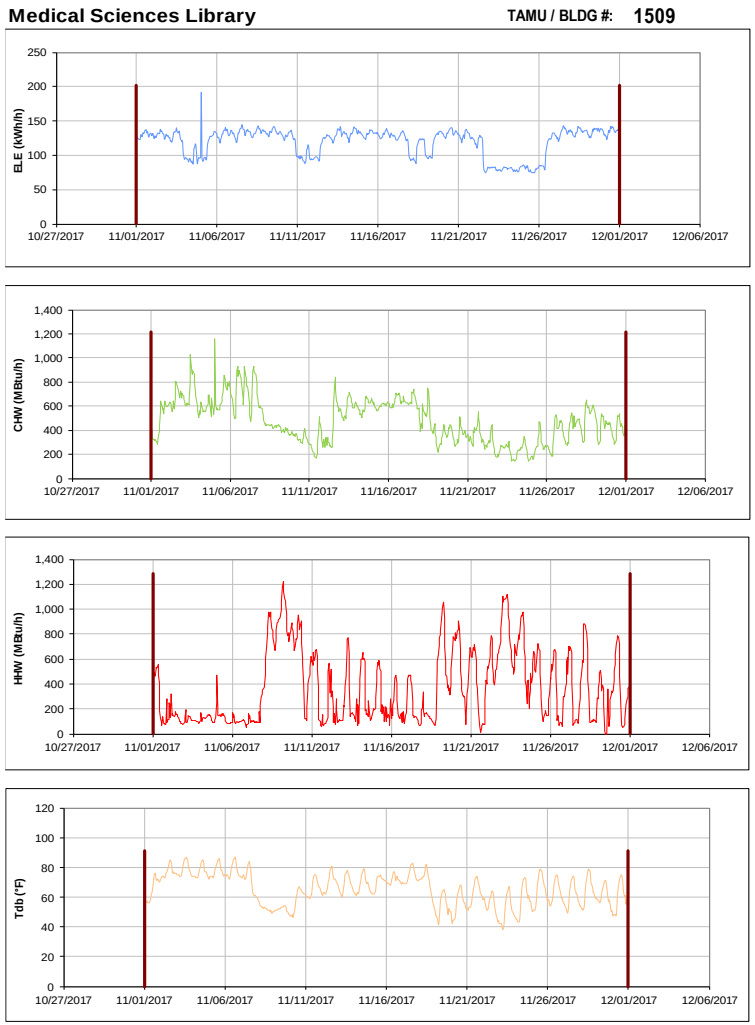


Figure III-164 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Medical Sciences Library during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-165 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Wehner Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-166 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for West Campus Library Facility during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

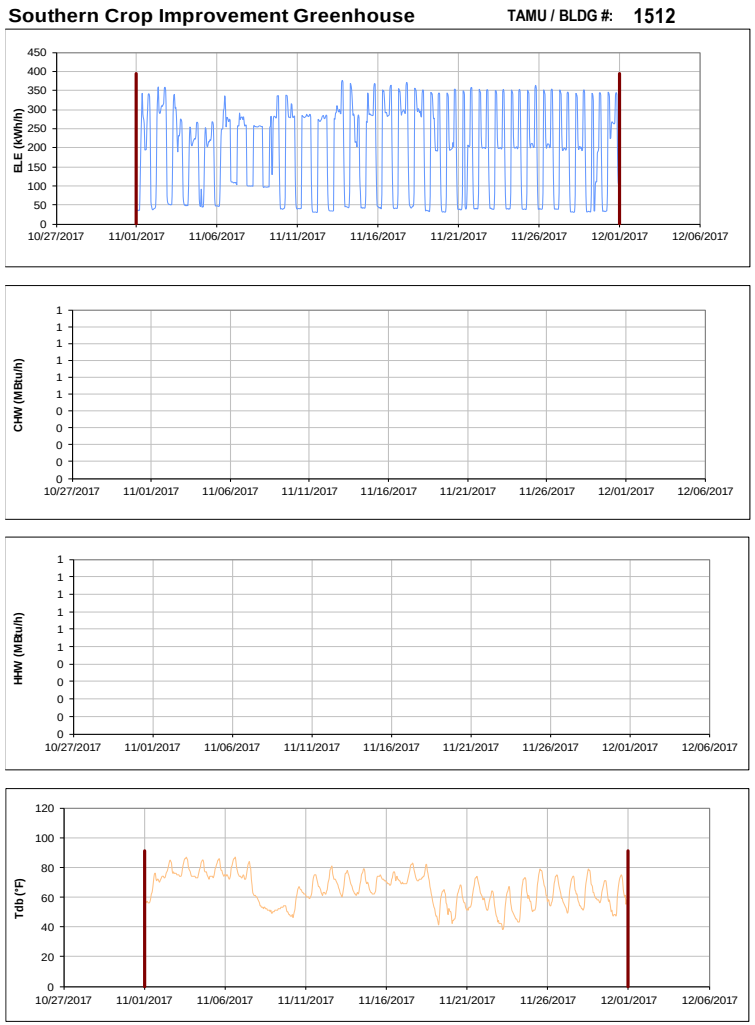


Figure III-167 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Southern Crop Improvement Greenhouse during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-168 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Borlaug Center for Southern Crop Improvement during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-169 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for TX School of Rural Public Health during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

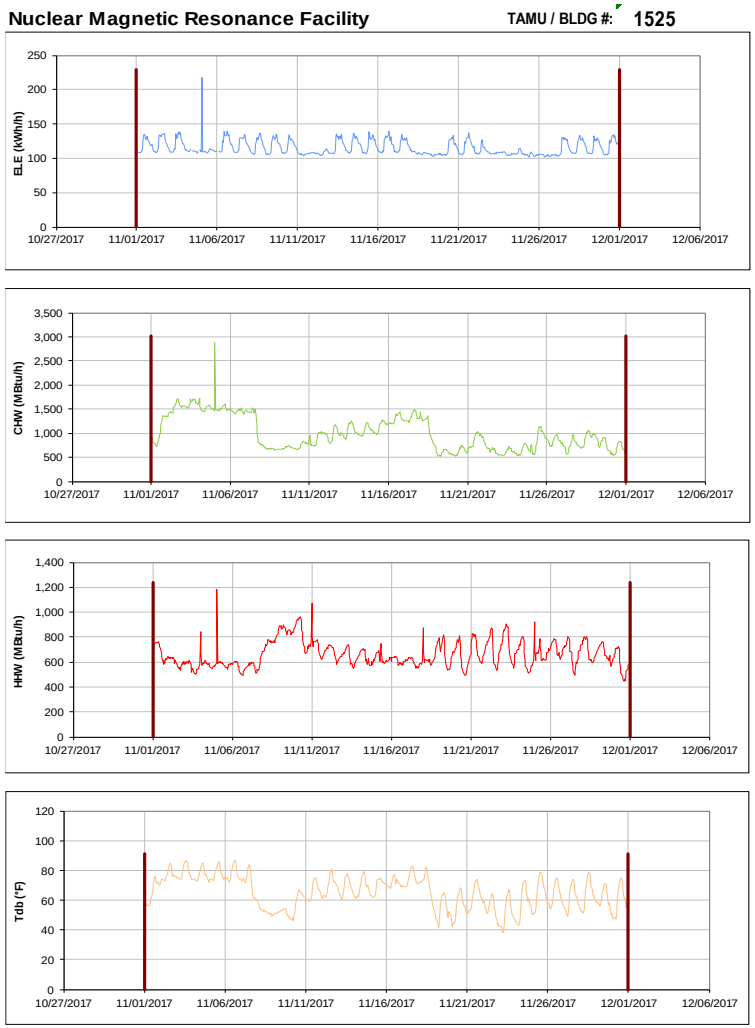


Figure III-170 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Nuclear Magnetic Resonance Facility during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-171 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Interdisciplinary Life Sciences Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

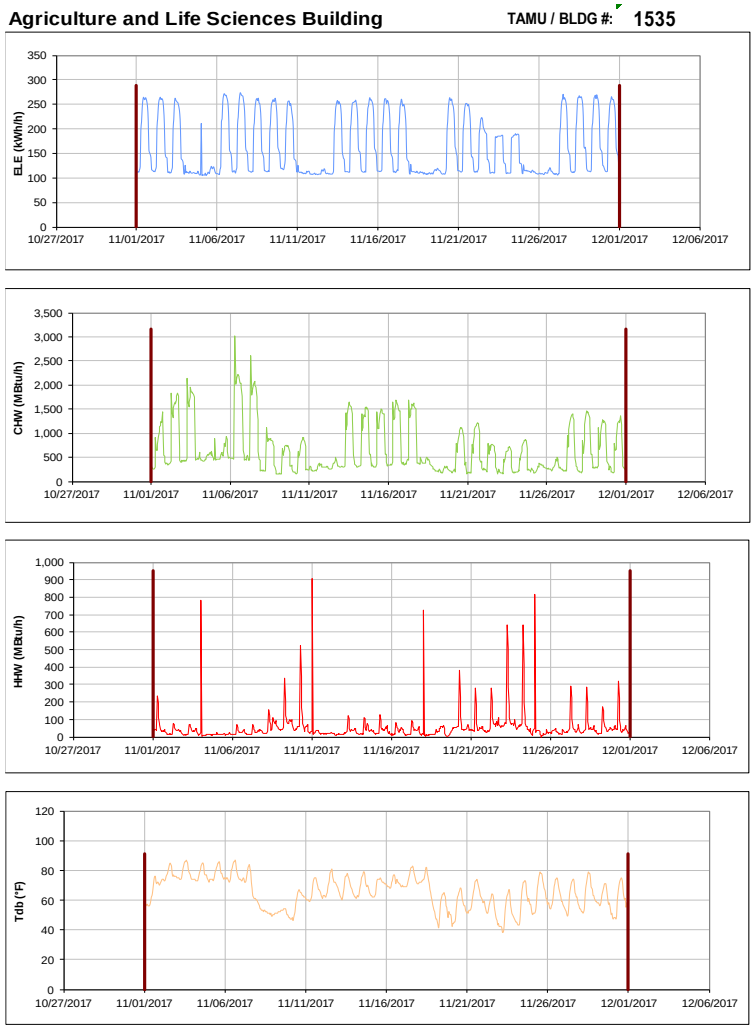


Figure III-172 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Agriculture and Life Sciences Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

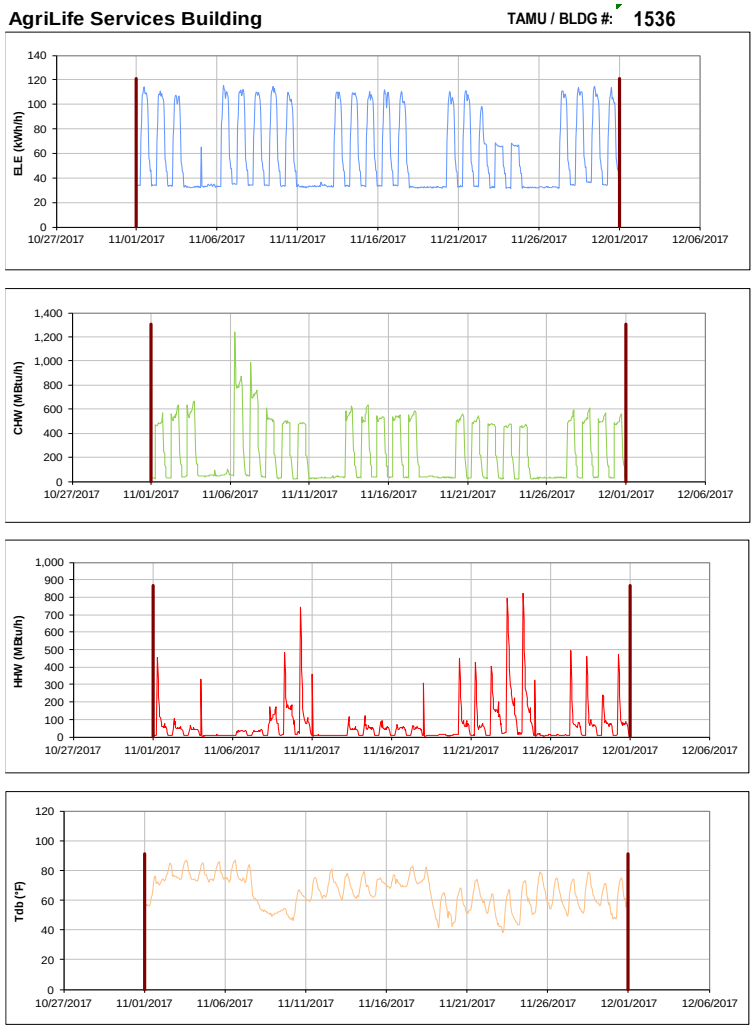


Figure III-173 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for AgriLife Services Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-174 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Wildlife Fisheries & Ecological Sciences Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-175 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Agriculture Program Visitors Center during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

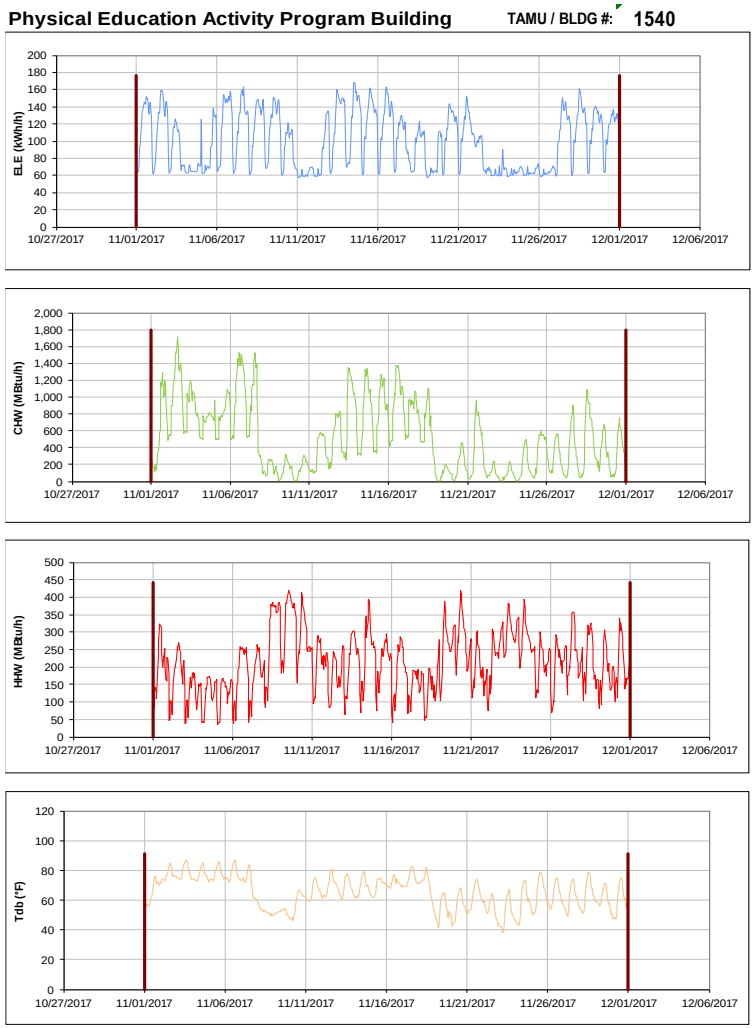


Figure III-176 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Physical Education Activity Program Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-177 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Human Clinical Research Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

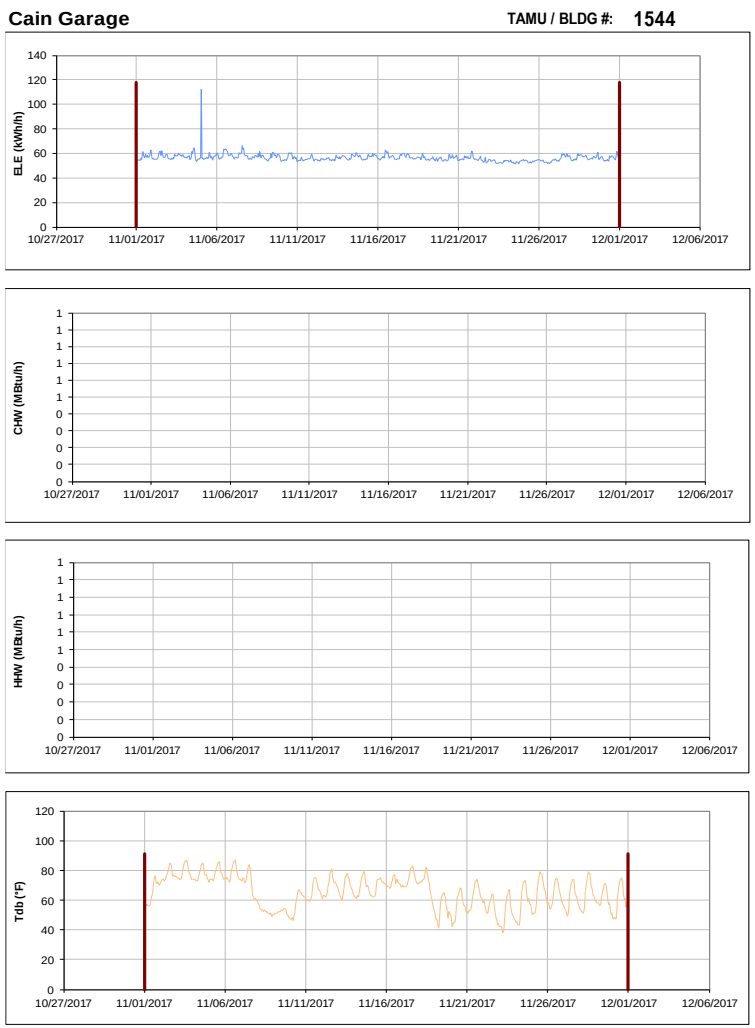


Figure III-178 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Cain Garage during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

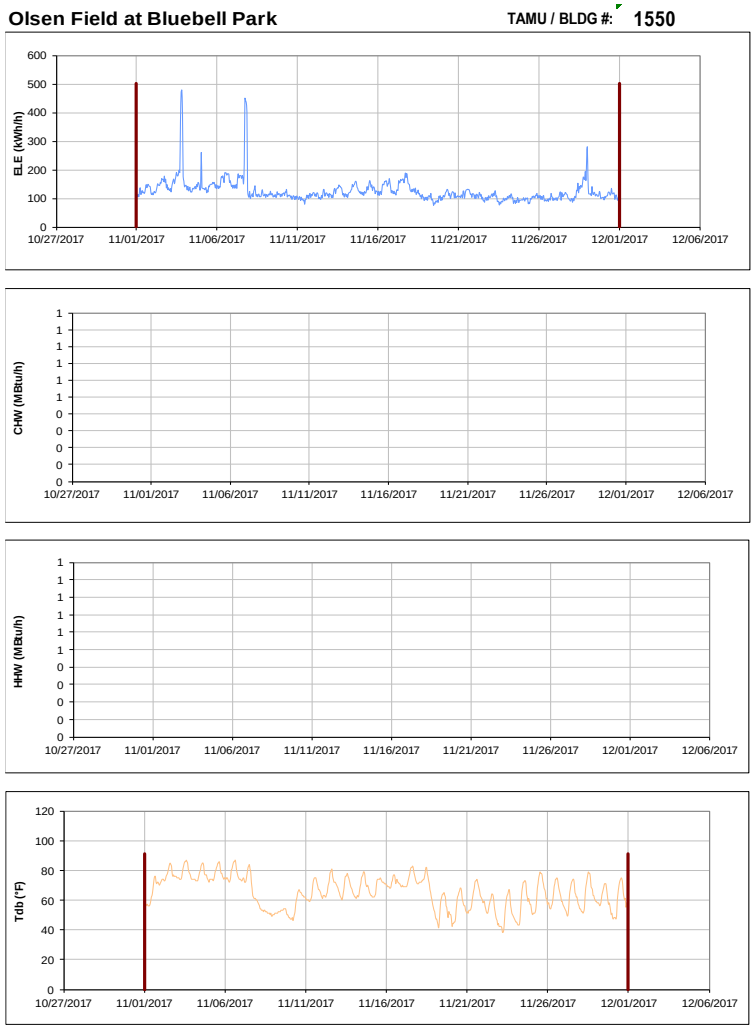


Figure III-179 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Olsen Field at Bluebell Park during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

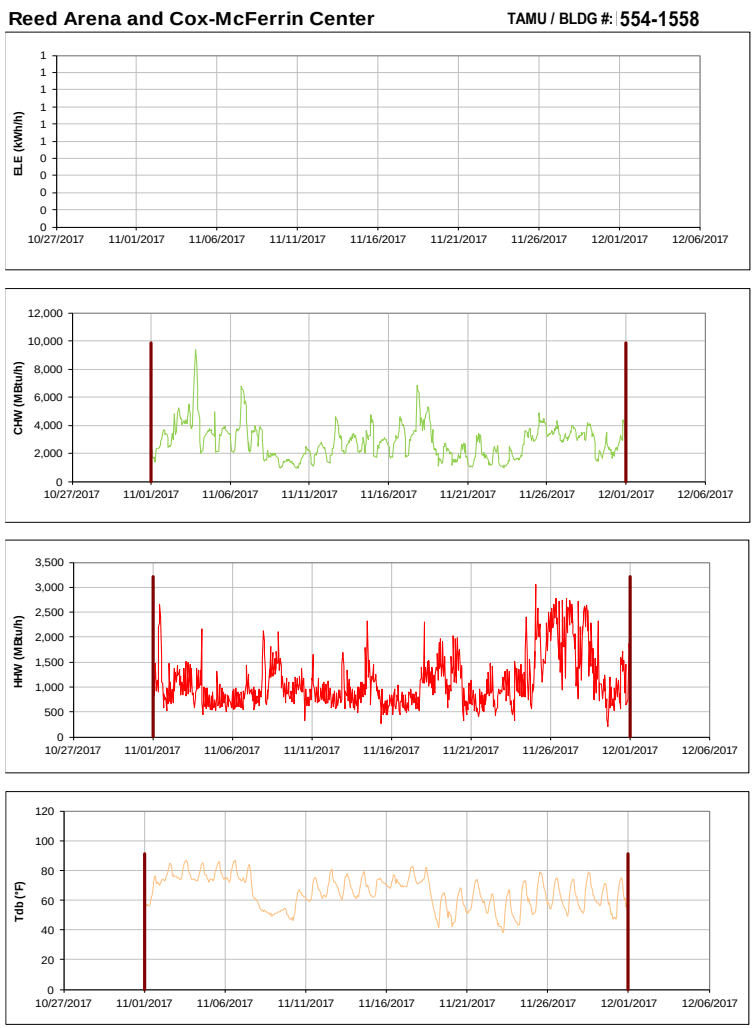


Figure III-180 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Reed Arena and Cox-McFerrin Center during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

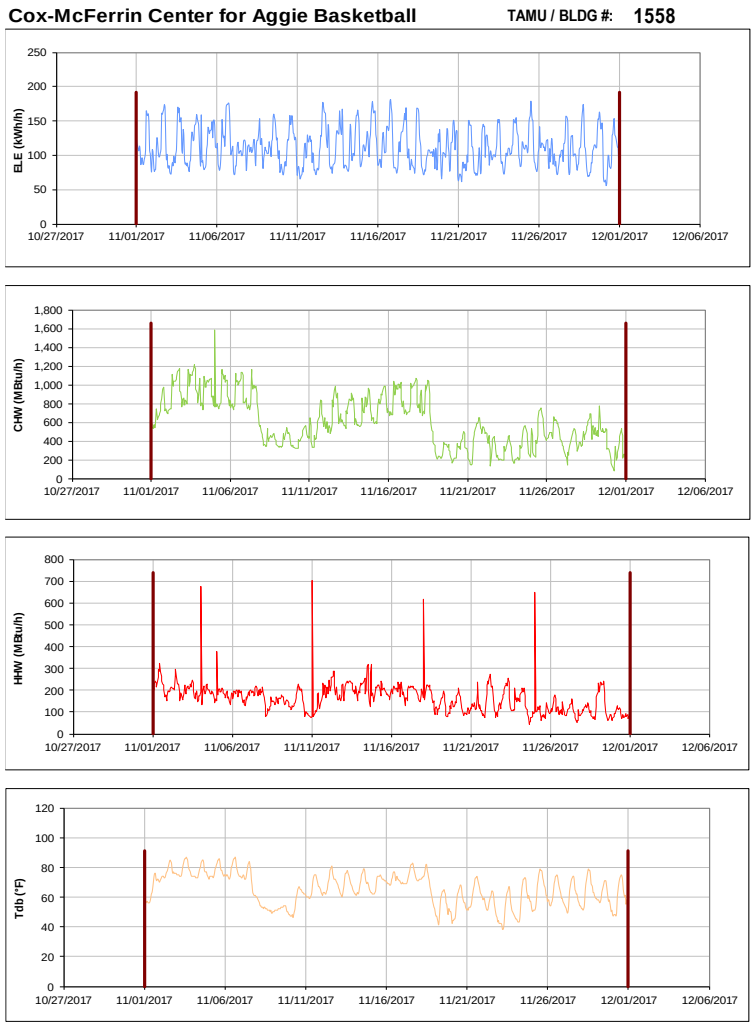


Figure III-181 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Cox-McFerrin Center for Aggie Basketball during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-182 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for West Campus Parking Garage during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

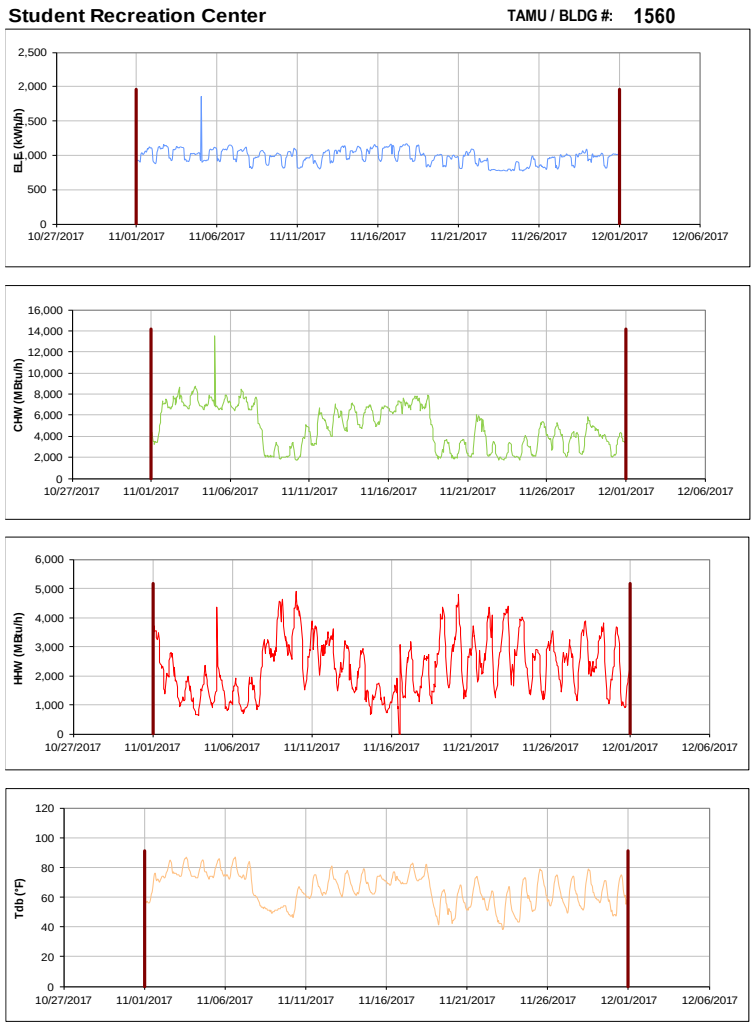


Figure III-183 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Student Recreation Center during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

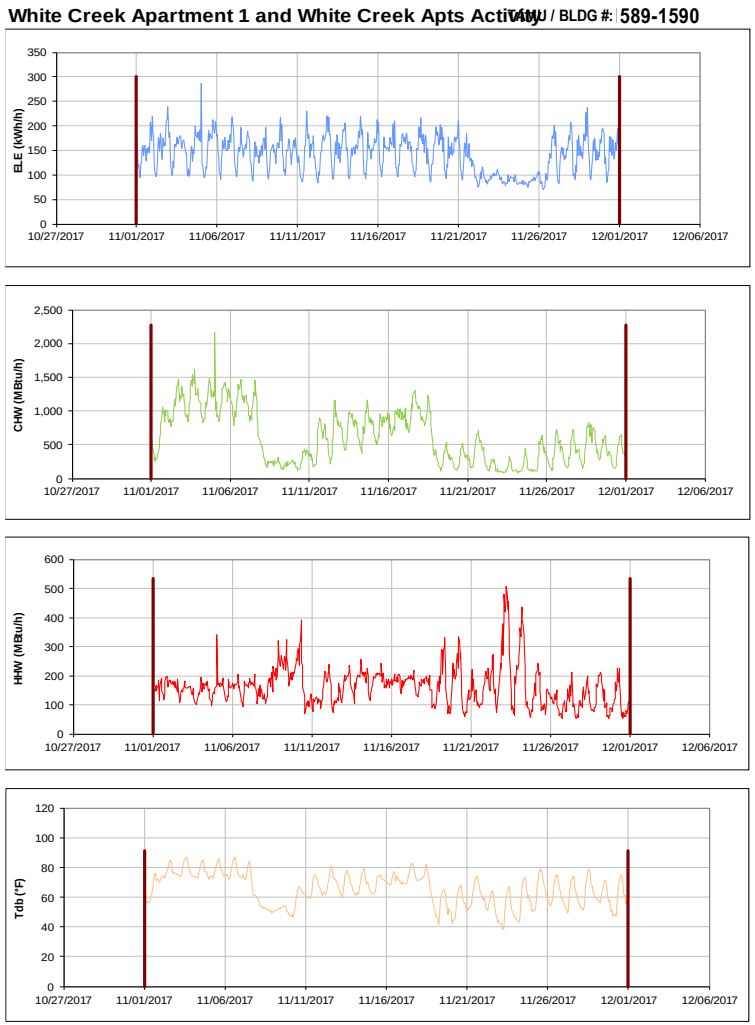


Figure III-184 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for White Creek Apartment 1 and White Creek Apts Activity Center during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station,

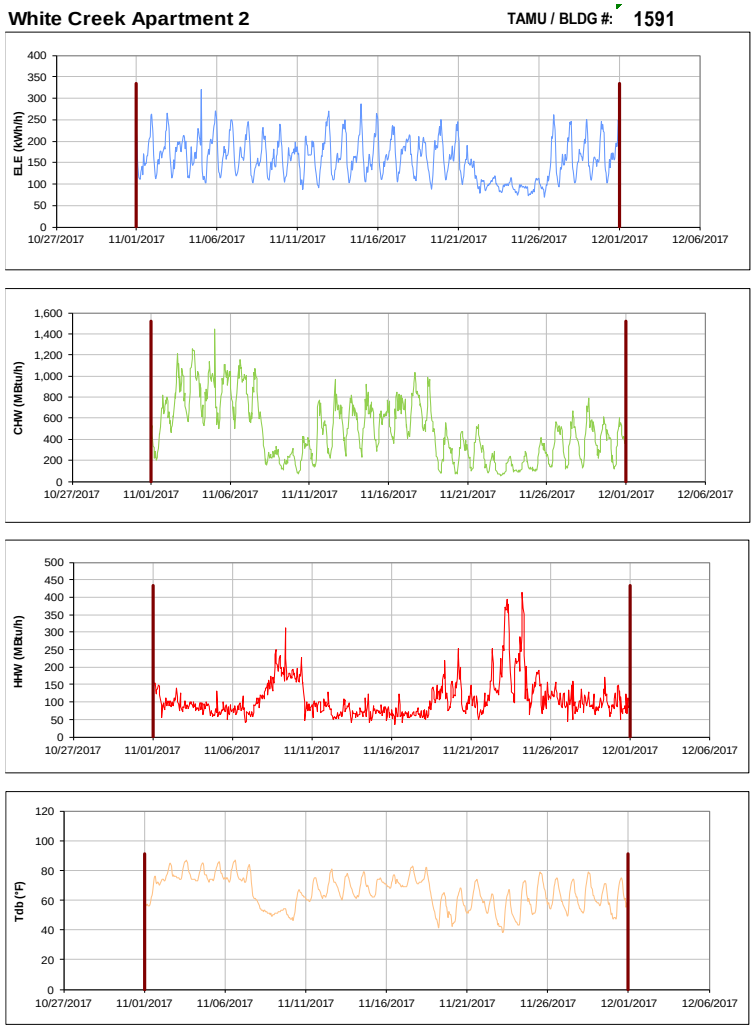


Figure III-185 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for White Creek Apartment 2 during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

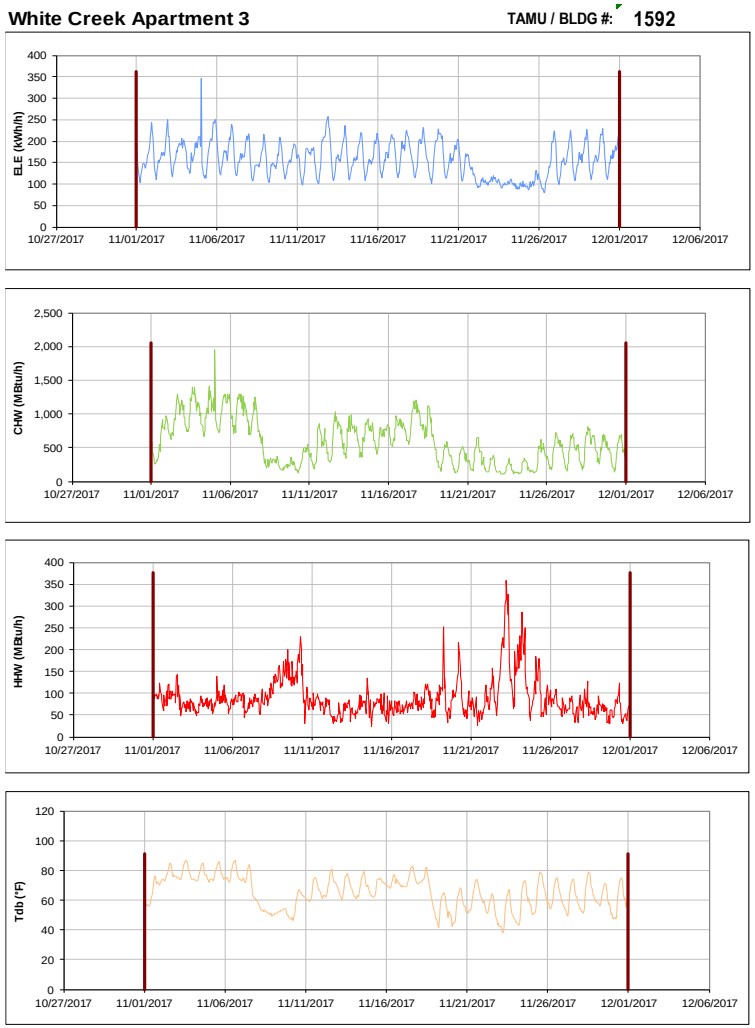


Figure III-186 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for White Creek Apartment 3 during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-187 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Gilchrist TTI Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

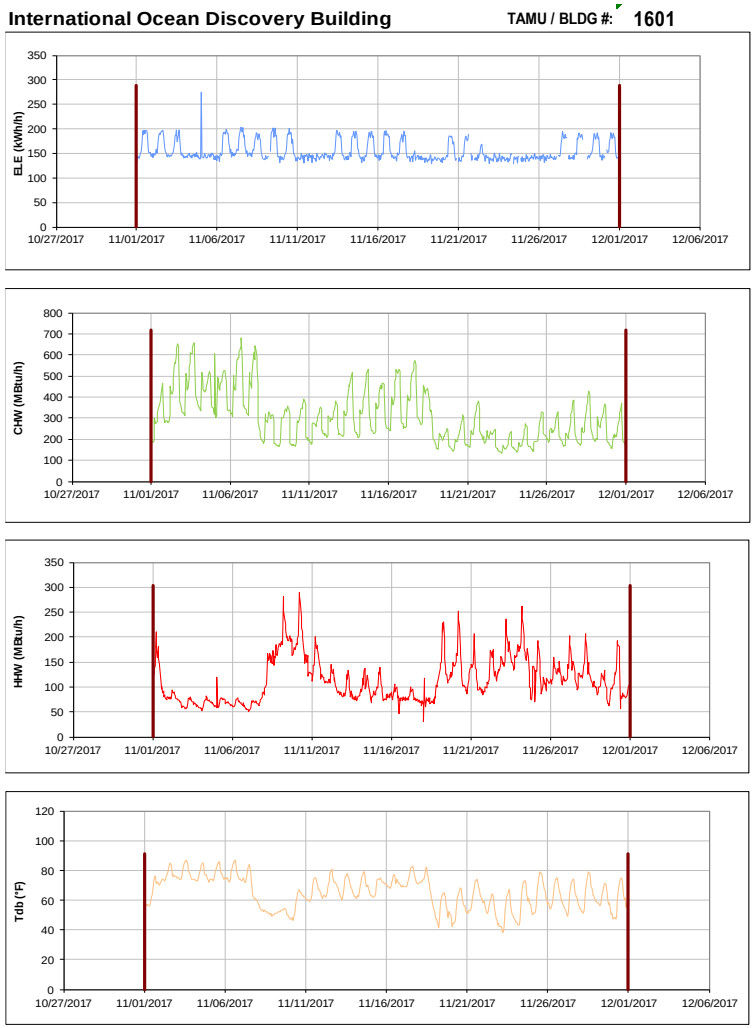


Figure III-188 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for International Ocean Discovery Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

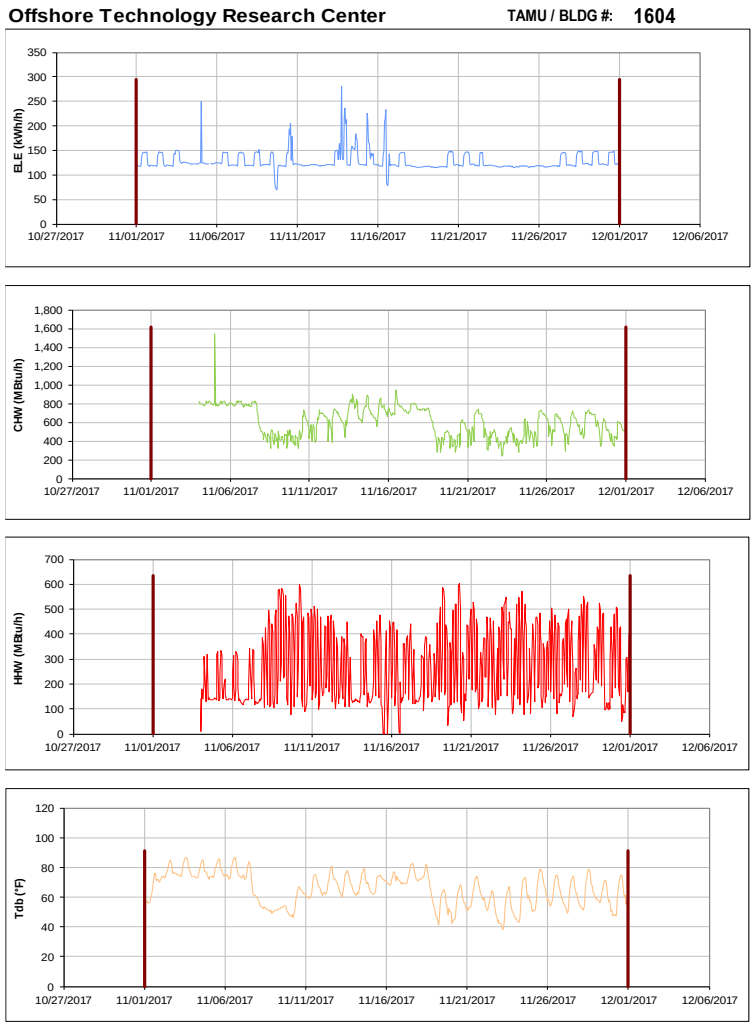


Figure III-189 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Offshore Technology Research Center during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

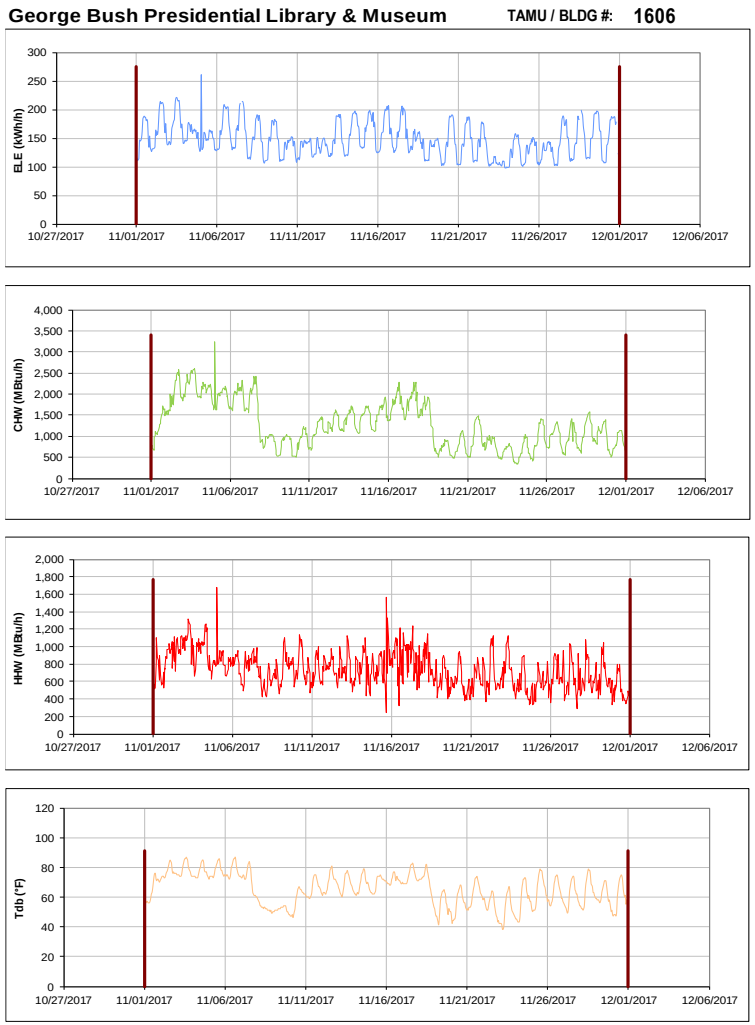


Figure III-190 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for George Bush Presidential Library & Museum during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-191 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Allen Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

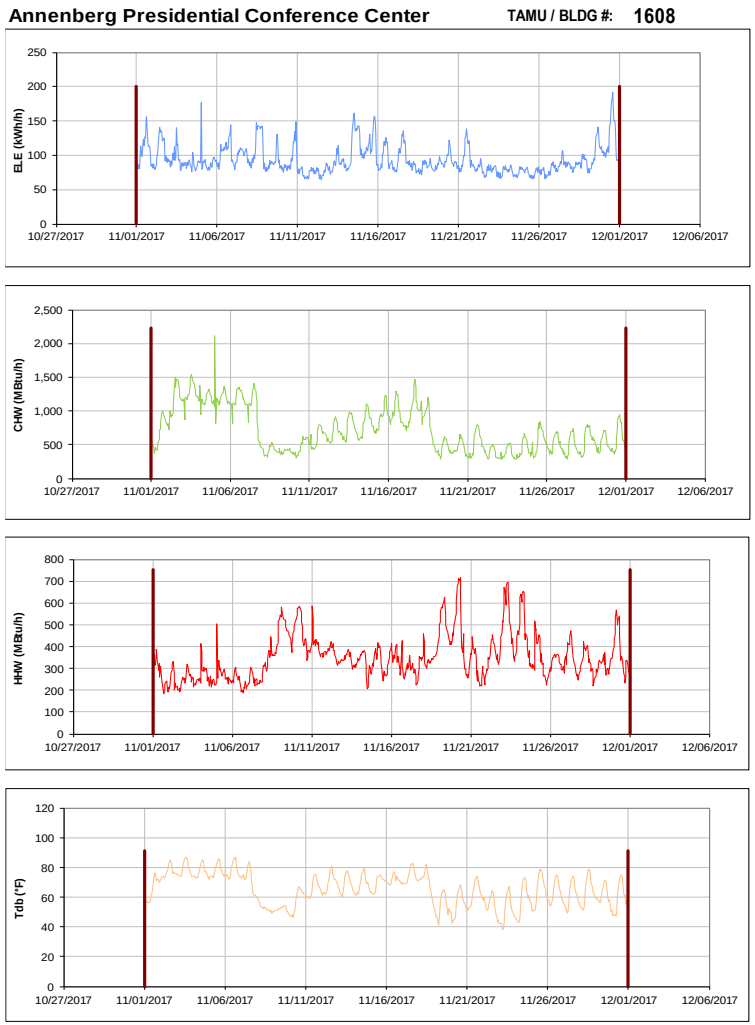


Figure III-192 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Annenberg Presidential Conference Center during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

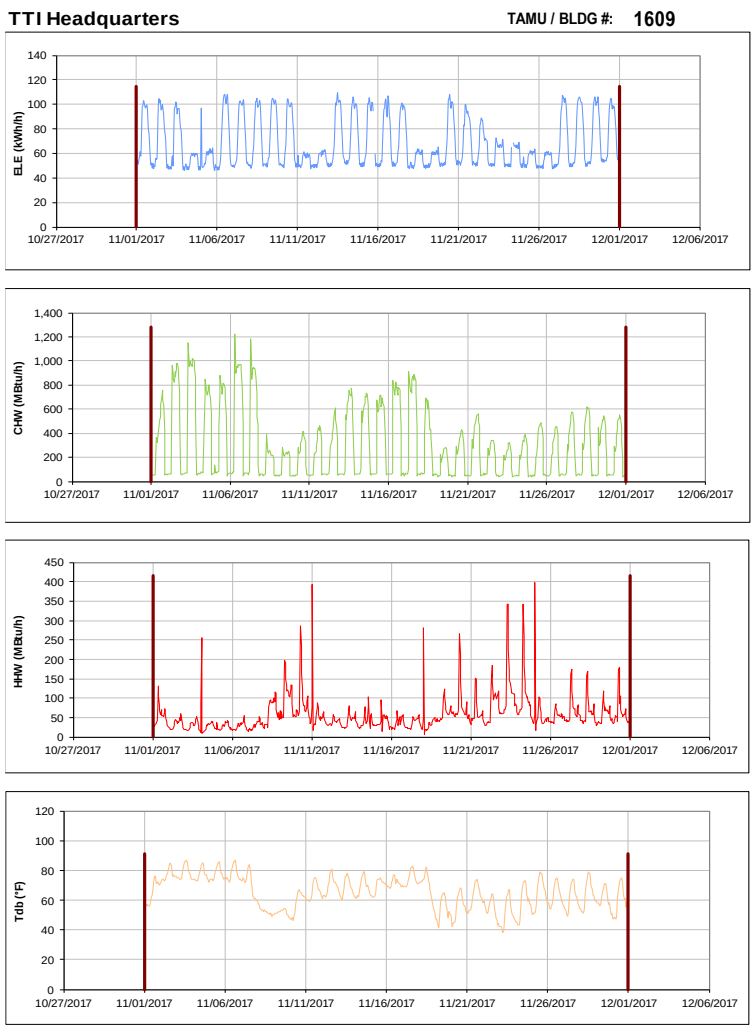


Figure III-193 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for TTI Headquarters during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

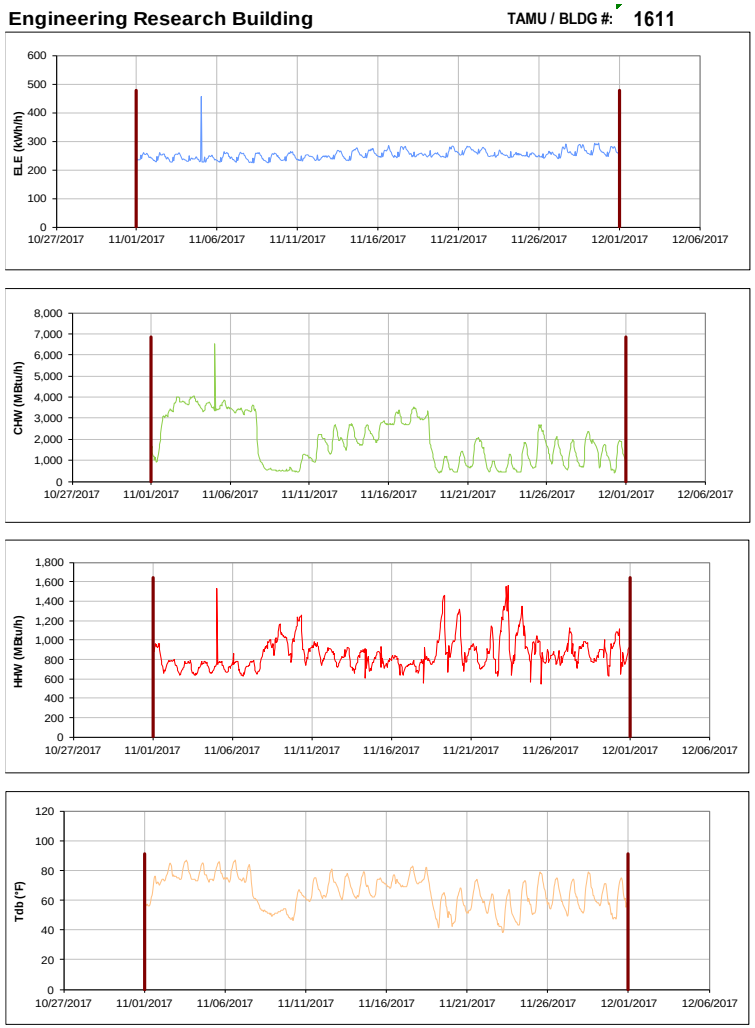


Figure III-194 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Engineering Research Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-195 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for General Services Complex during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

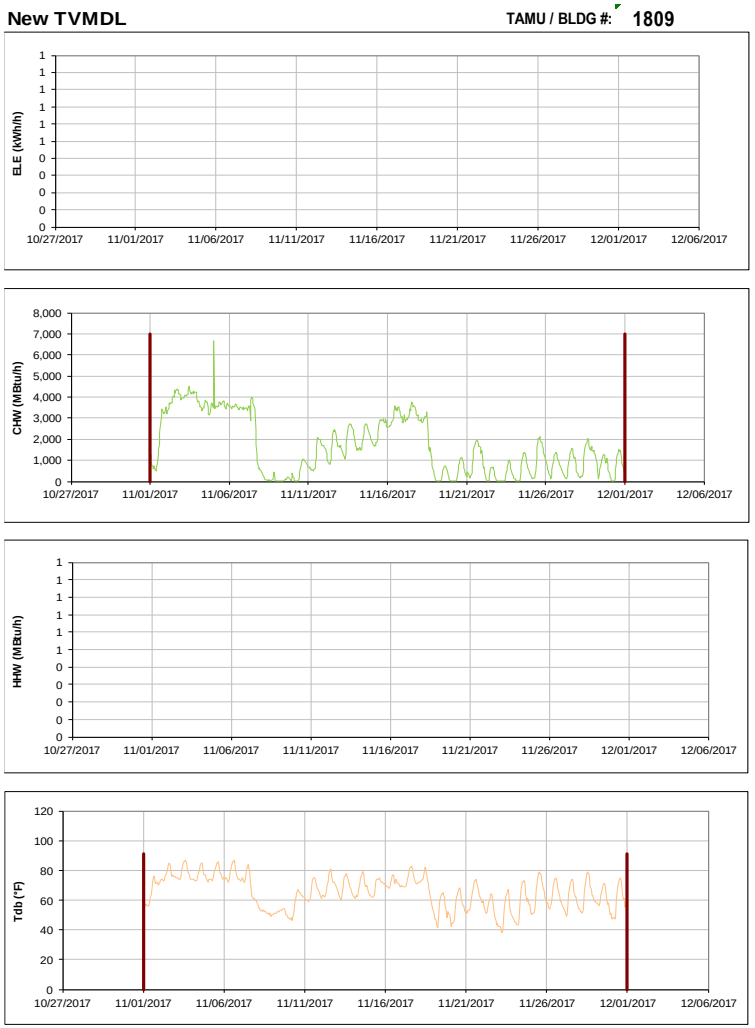


Figure III-196 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for New TVMDL during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

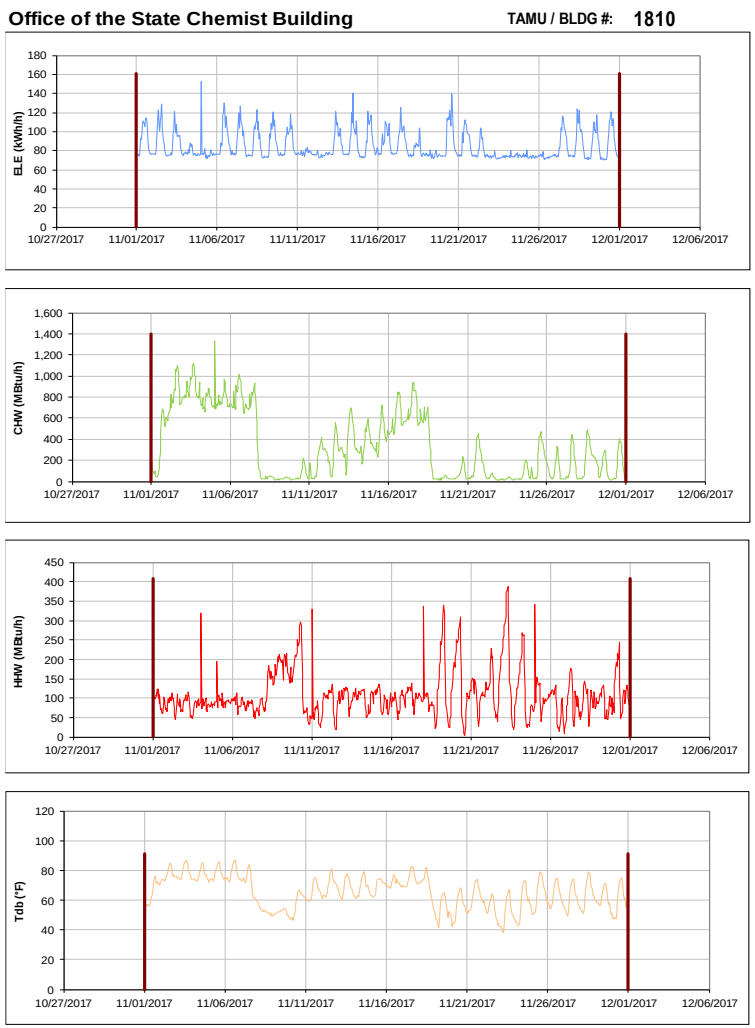


Figure III-197 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Office of the State Chemist Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-198 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Vet Med Research Bldg Addition during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-199 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Veterinary Medicine Building 1, 2, and 3 during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-200 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Texas Institute for Genomic Medicine during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

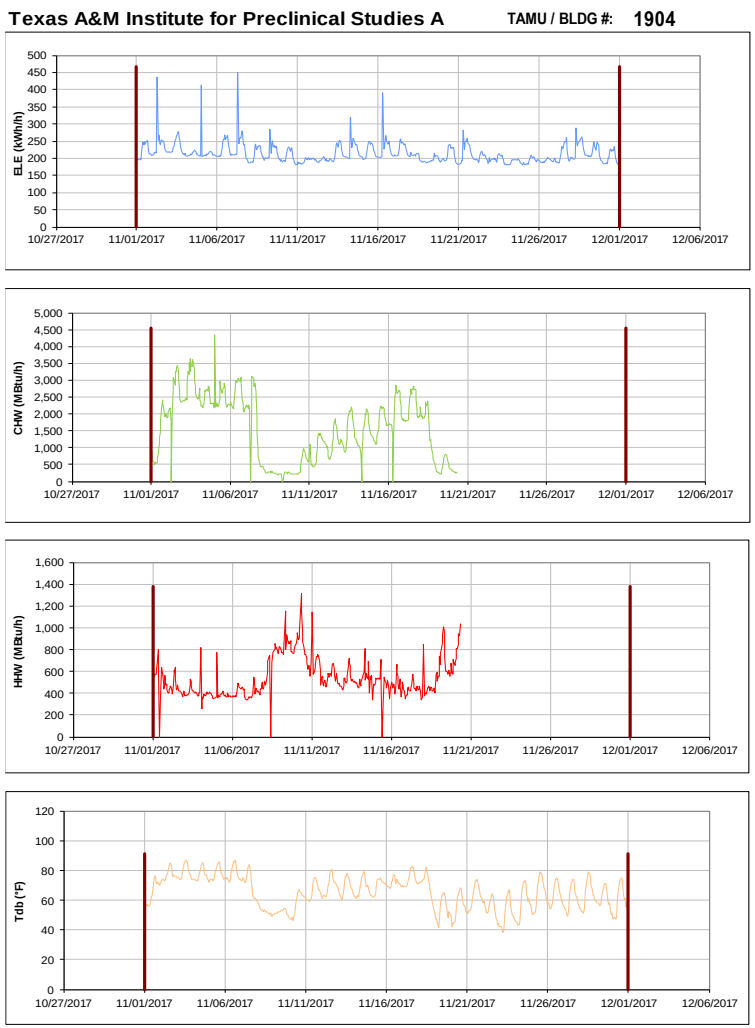


Figure III-201 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Texas A&M Institute for Preclinical Studies A during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-202 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for National Center for Therapeutics Manufacturing during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

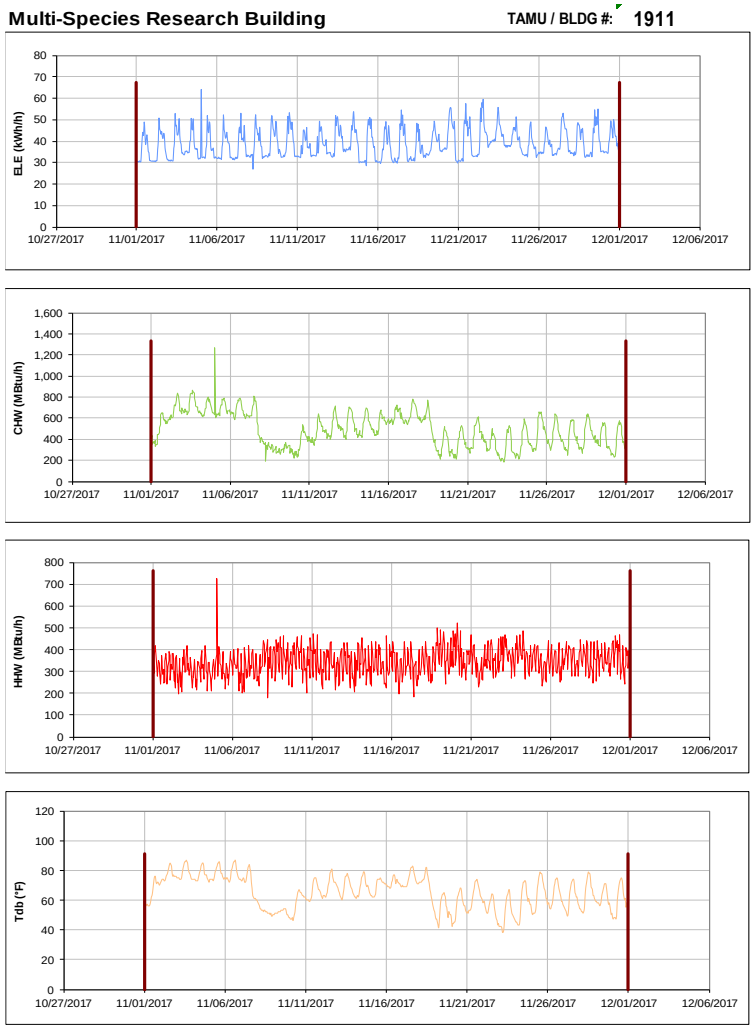


Figure III-203 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Multi-Species Research Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-204 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for NCTM Manufacturing Building during the Month of November 2017 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

IV. Energy Balance Plots for November 2017 Consumption

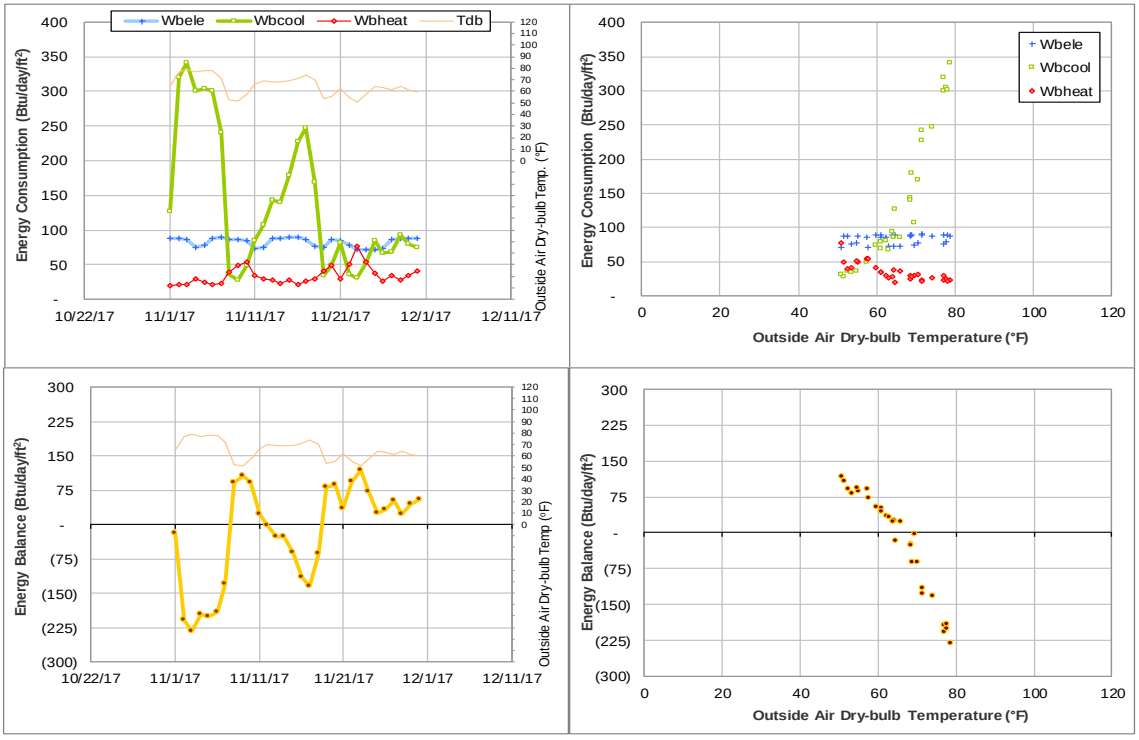


Figure IV-1 Emerging Technologies Building TAMU BLDG # 270 Energy Balance Plot during November 2017

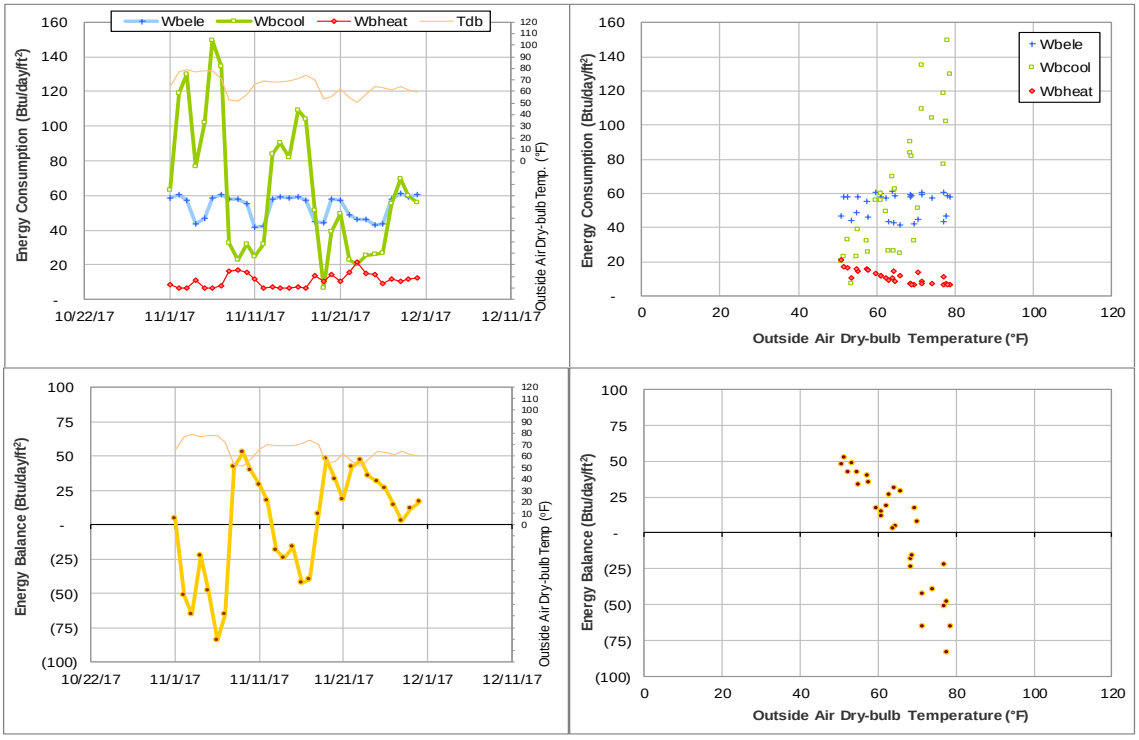


Figure IV-2 Liberal Arts and Arts & Humanities Building TAMU BLDG # 275 Energy Balance Plot during November 2017

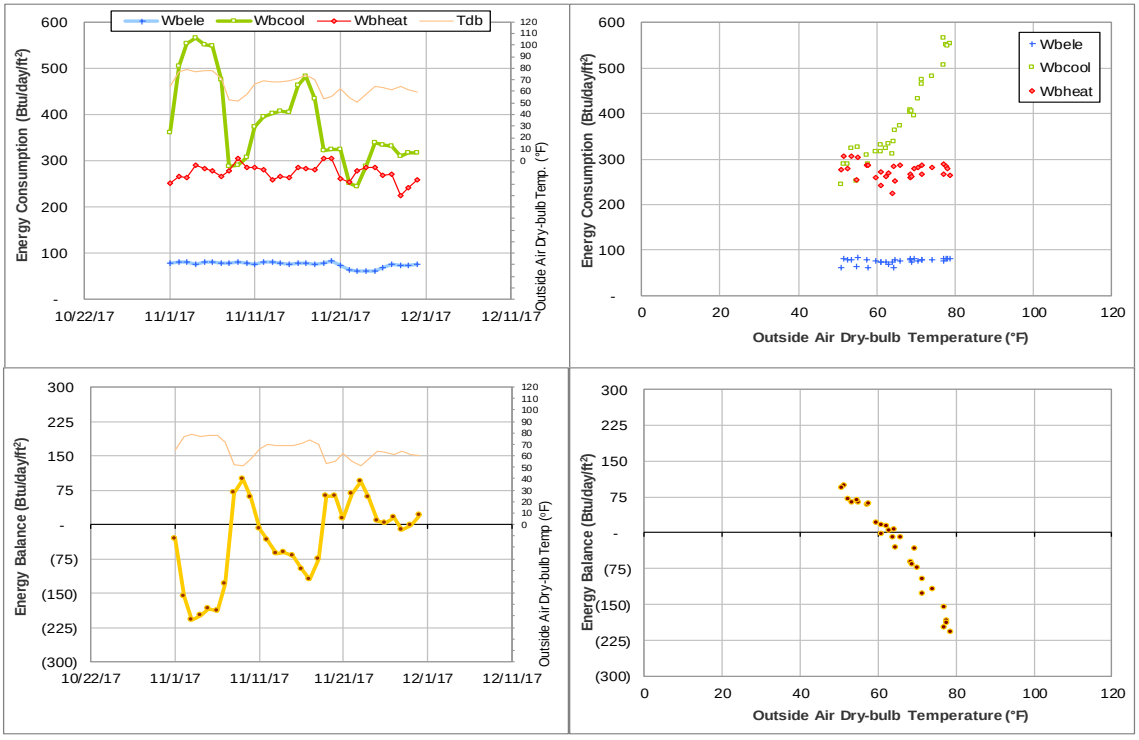


Figure IV-3 Wells Residence Hall TAMU BLDG # 290 Energy Balance Plot during November 2017

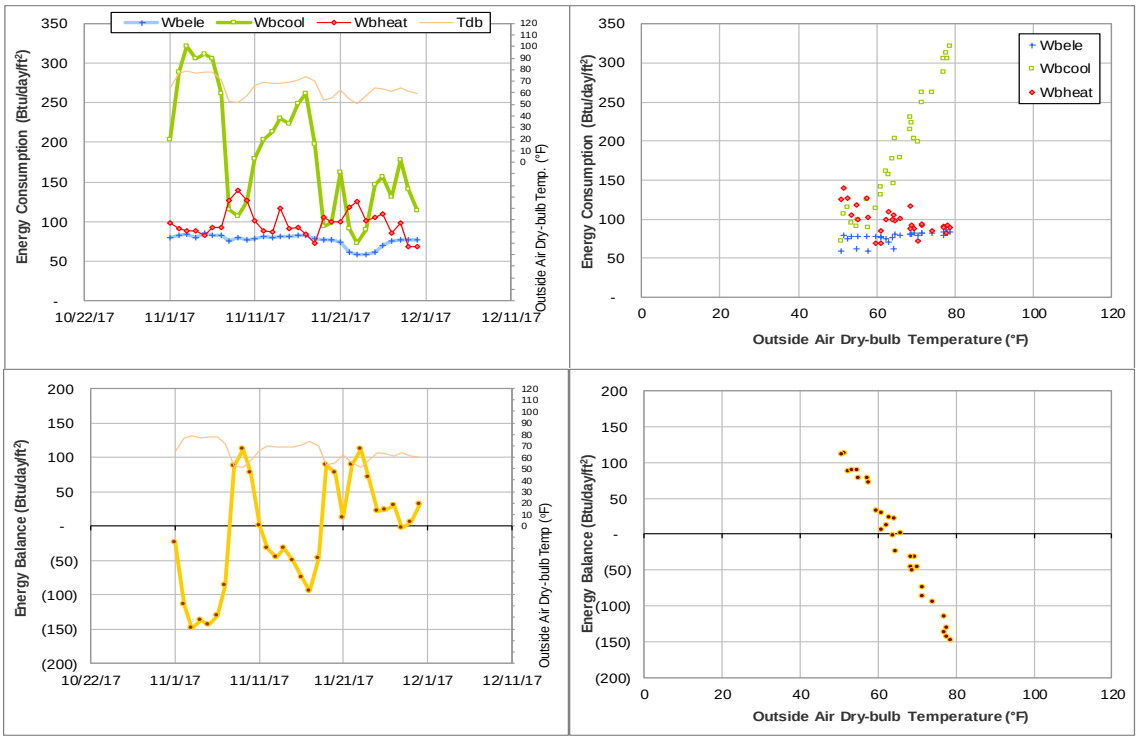


Figure IV-4 Rudder Residence Hall TAMU BLDG # 291 Energy Balance Plot during November 2017

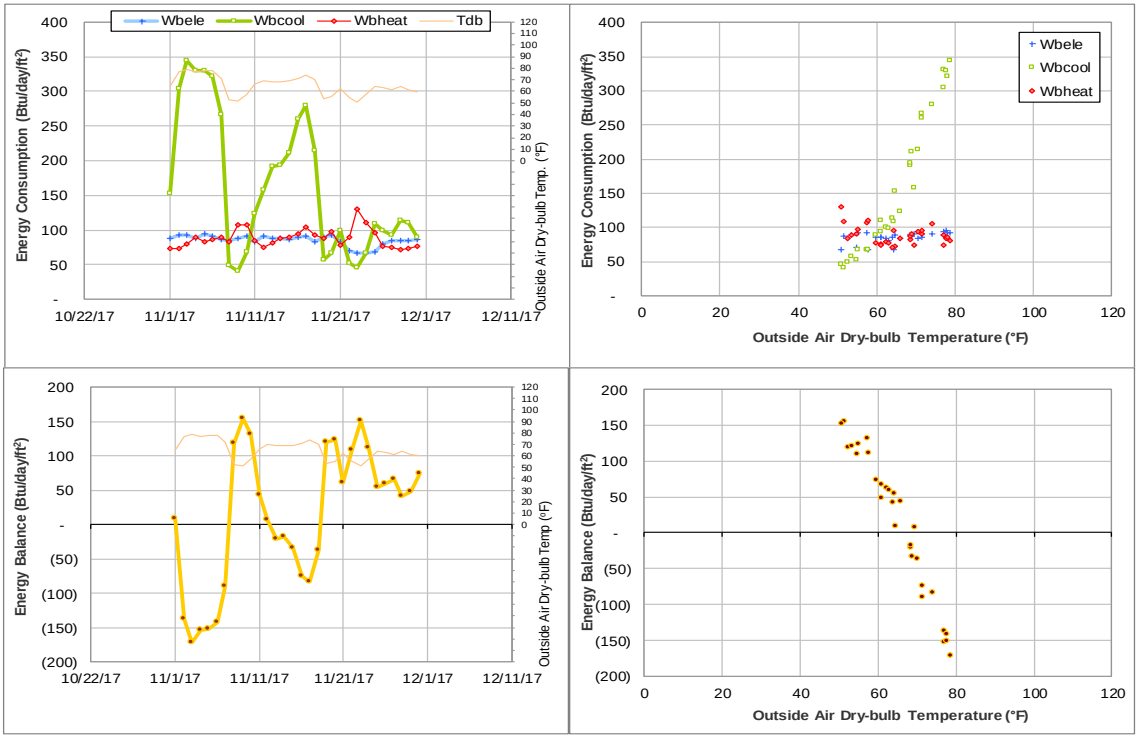


Figure IV-5 Eppright Residence Hall TAMU BLDG # 292 Energy Balance Plot during November 2017

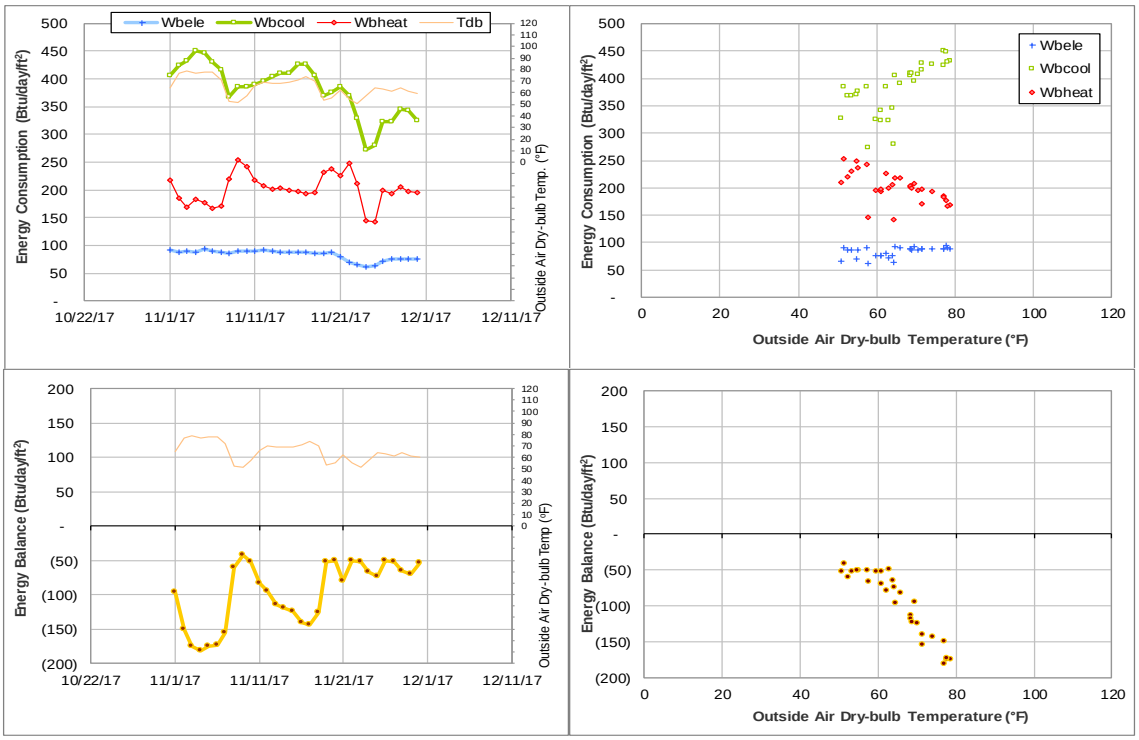


Figure IV-6 Appelt Residence Hall TAMU BLDG # 293 Energy Balance Plot during November 2017

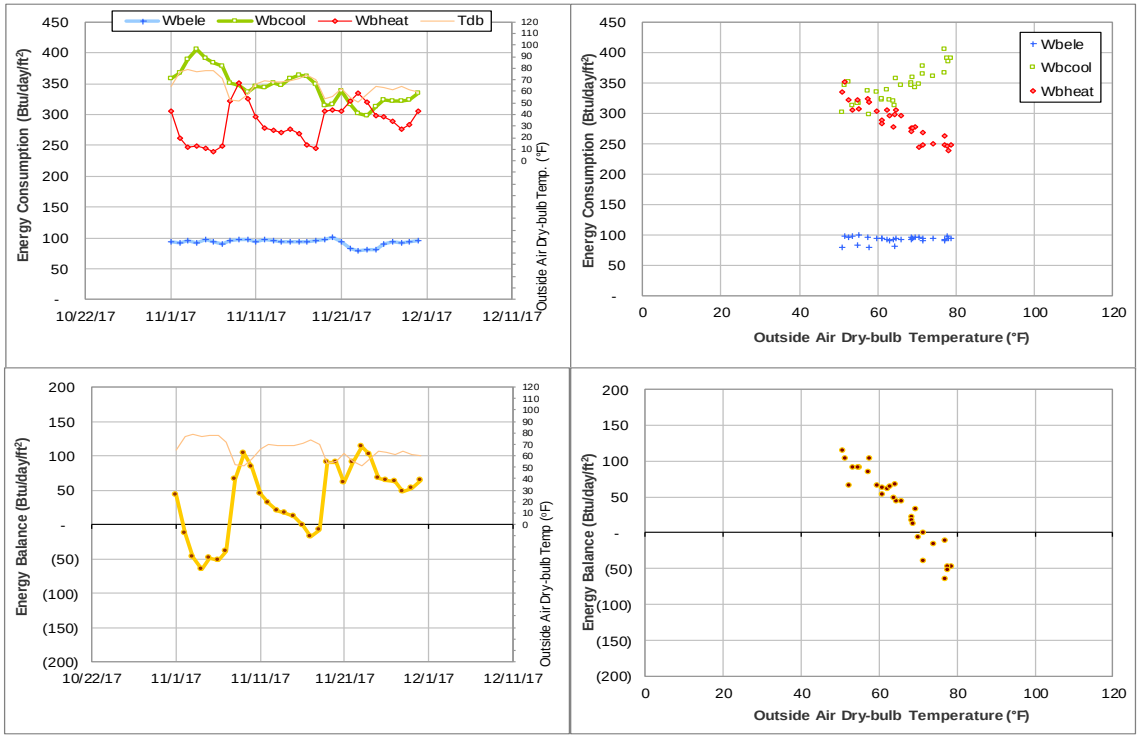


Figure IV-7 Lechner Residence Hall TAMU BLDG # 294 Energy Balance Plot during November 2017

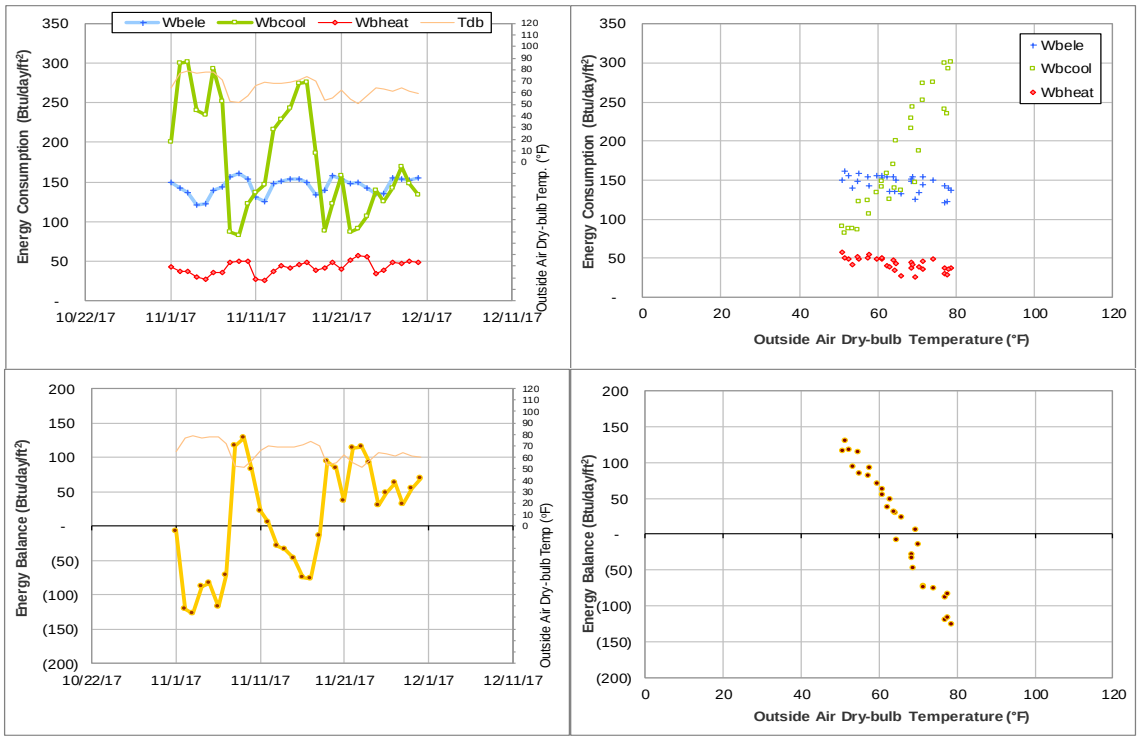


Figure IV-8 Mitchell Inst. for Fundamental Phys & Astronomy TAMU BLDG # 296 Energy Balance Plot during November 2017

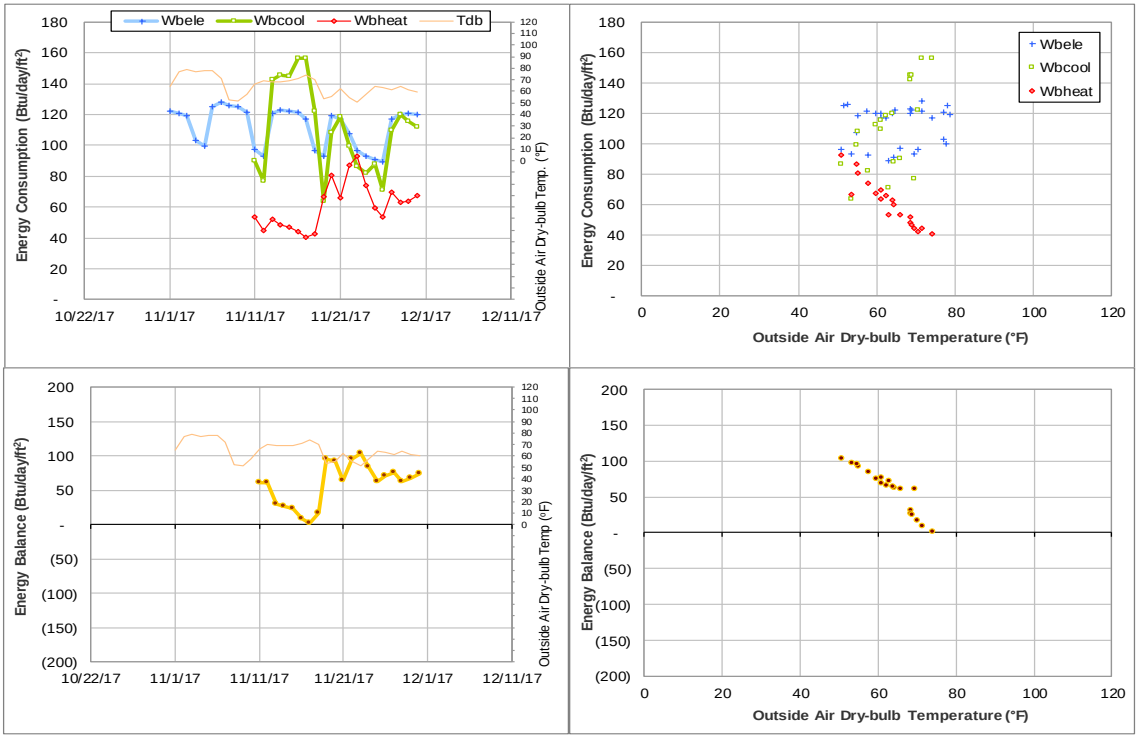


Figure IV-9 CE TTI Office & Lab Building TAMU BLDG # 325 Energy Balance Plot during November 2017

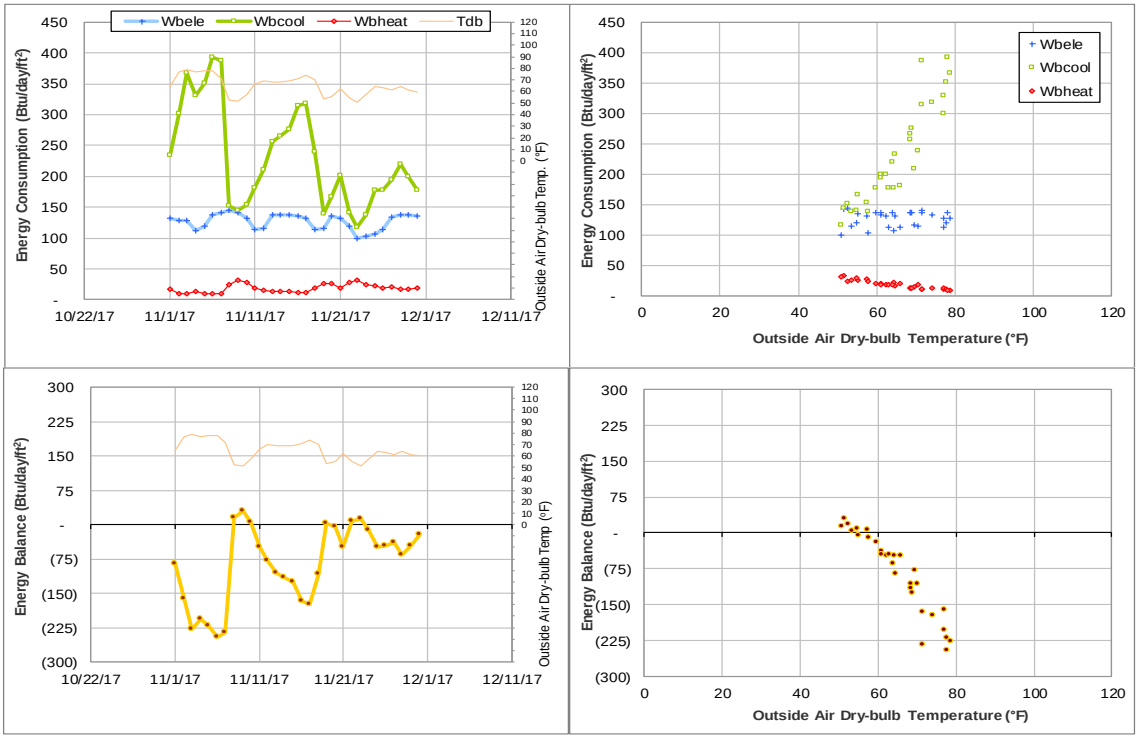


Figure IV-10 Bright Aerospace Building TAMU BLDG # 353 Energy Balance Plot during November 2017

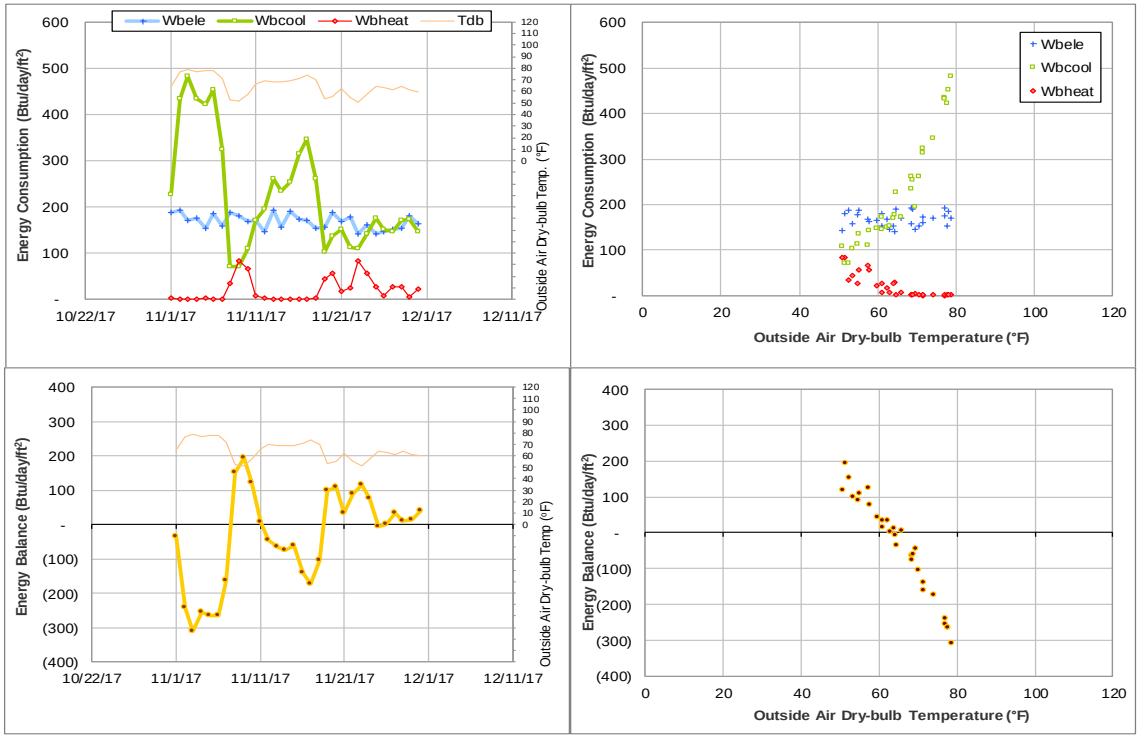


Figure IV-11 Davis Football Player Development Center TAMU BLDG # 358 Energy Balance Plot during November 2017

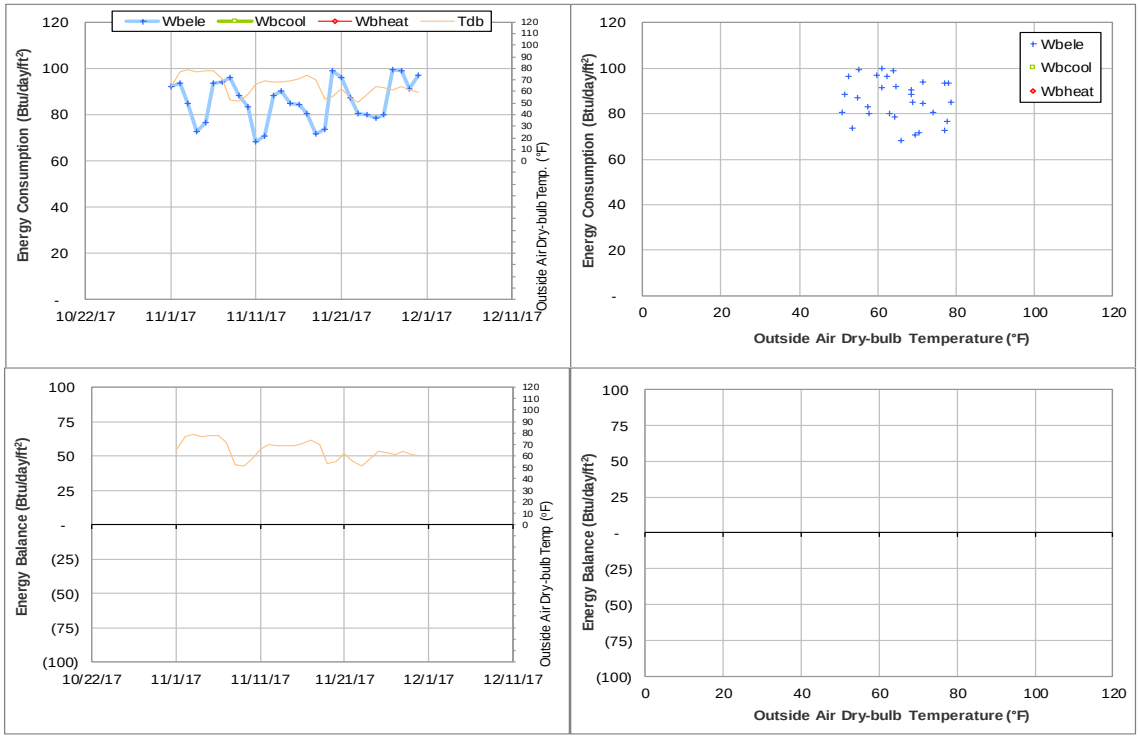


Figure IV-12 Architecture Building B TAMU BLDG # 359 Energy Balance Plot during November 2017

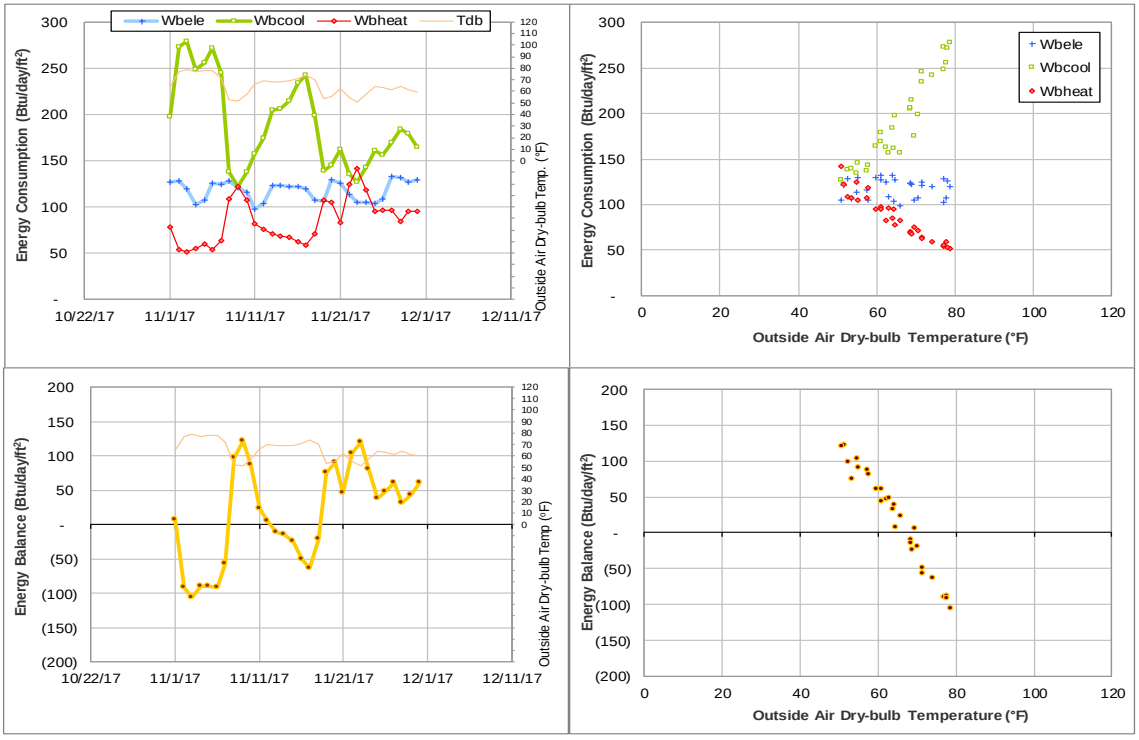


Figure IV-13 Architecture Building B&C TAMU BLDG # 359 Energy Balance Plot during November 2017

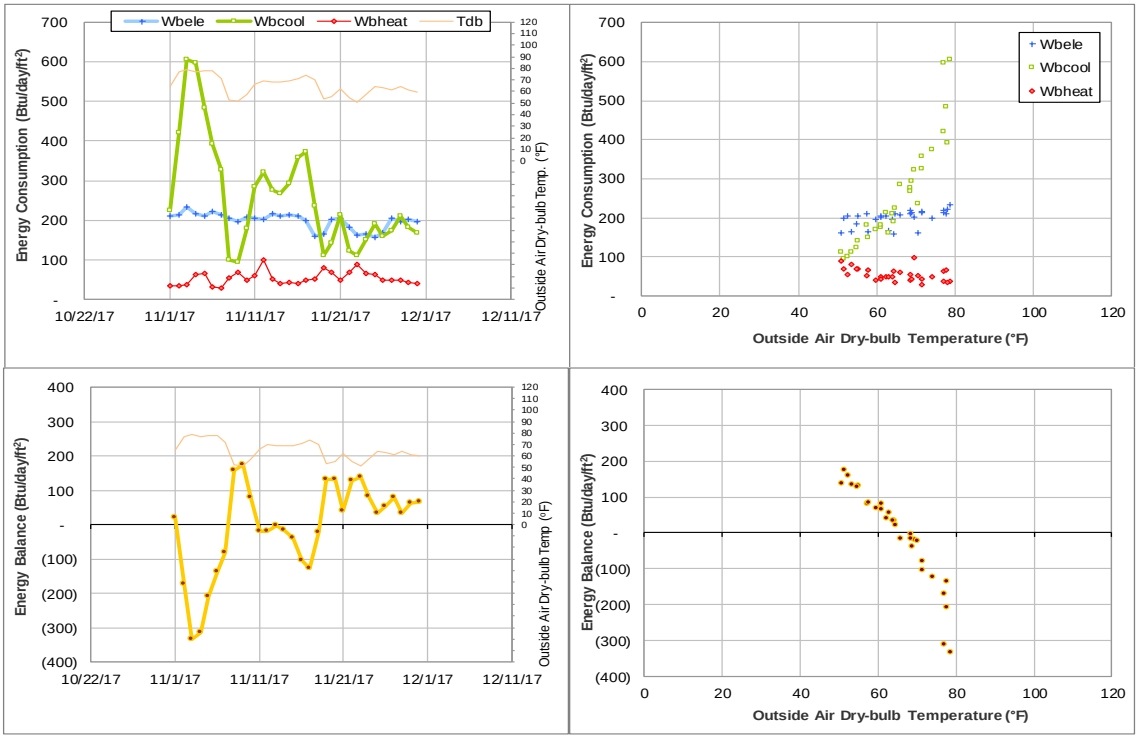


Figure IV-14 Bright Football Complex TAMU BLDG # 361 Energy Balance Plot during November 2017

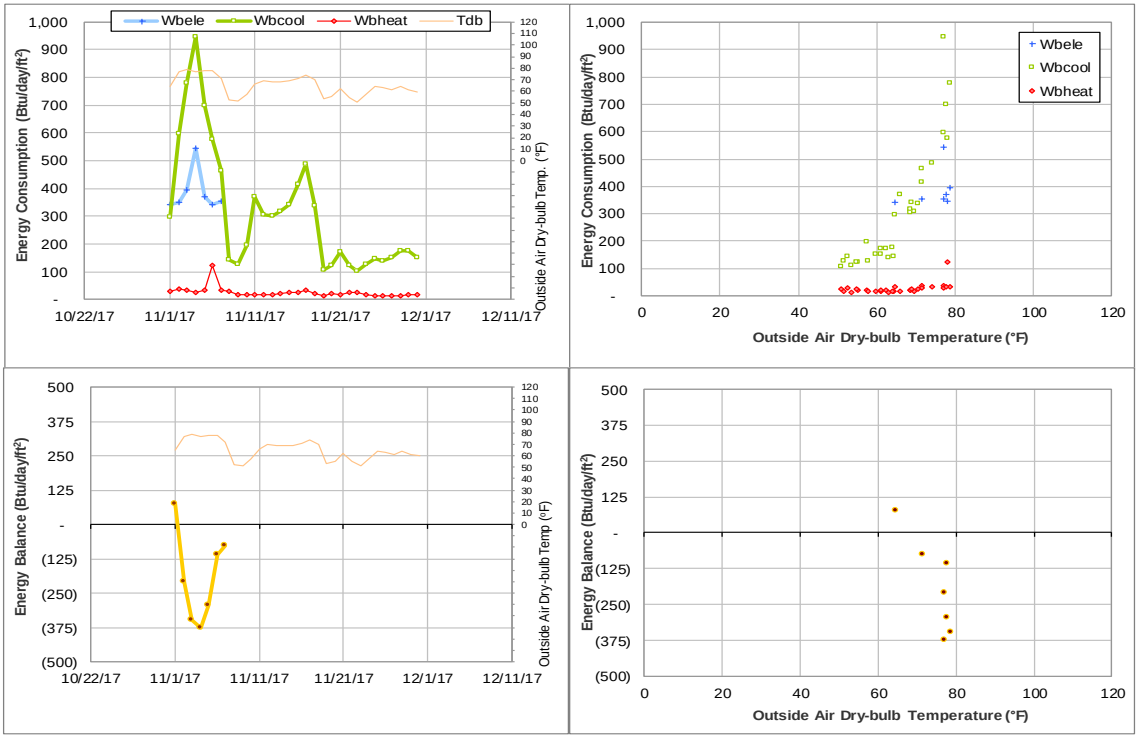


Figure IV-15 Kyle Field TAMU BLDG # 367 Energy Balance Plot during November 2017

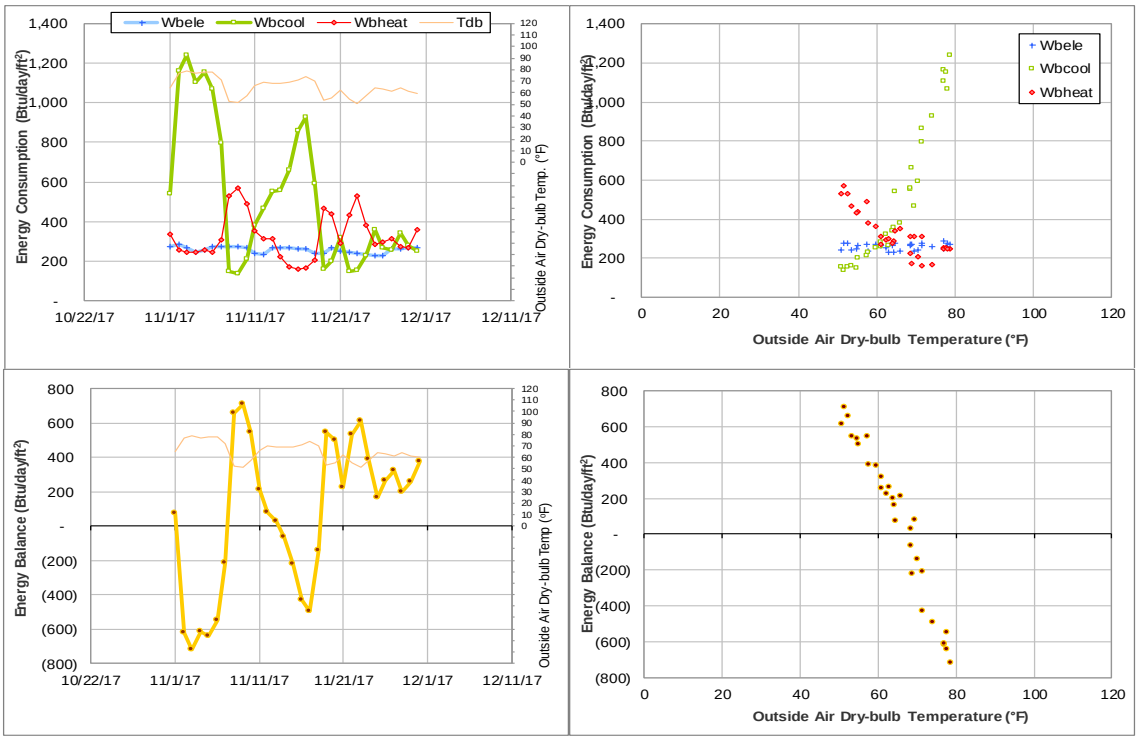


Figure IV-16 Chemistry Building Addition TAMU BLDG # 376 Energy Balance Plot during November 2017

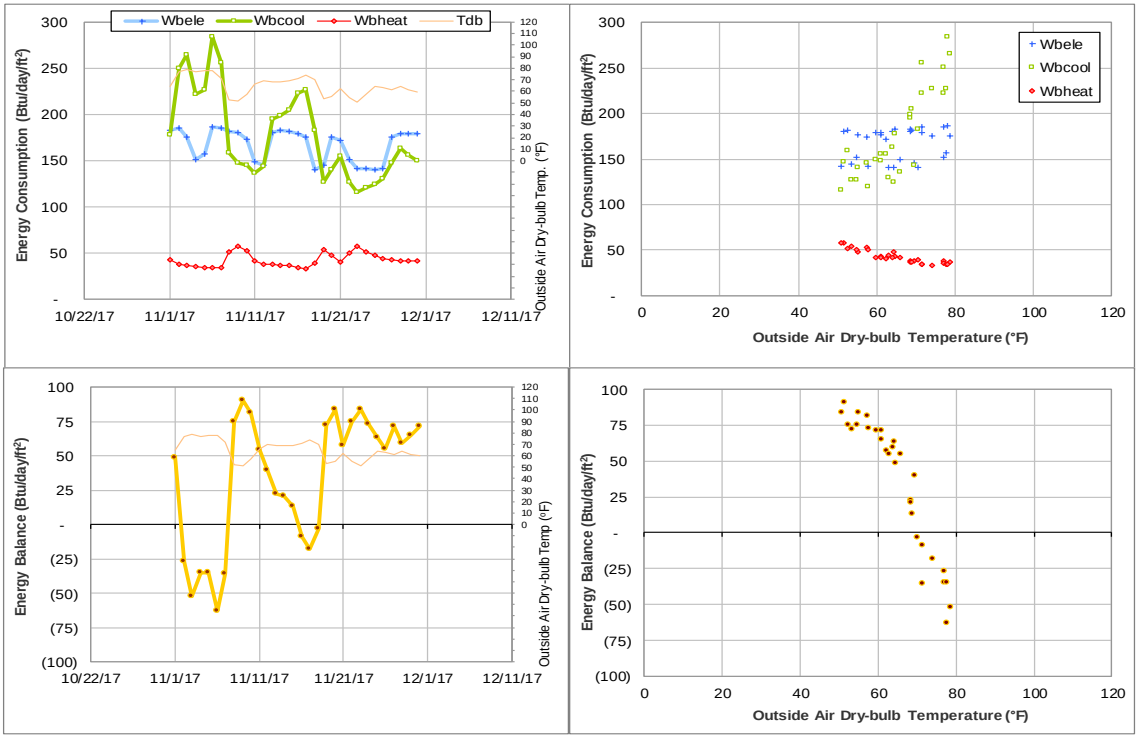


Figure IV-17 Koldus Building TAMU BLDG # 383 Energy Balance Plot during November 2017

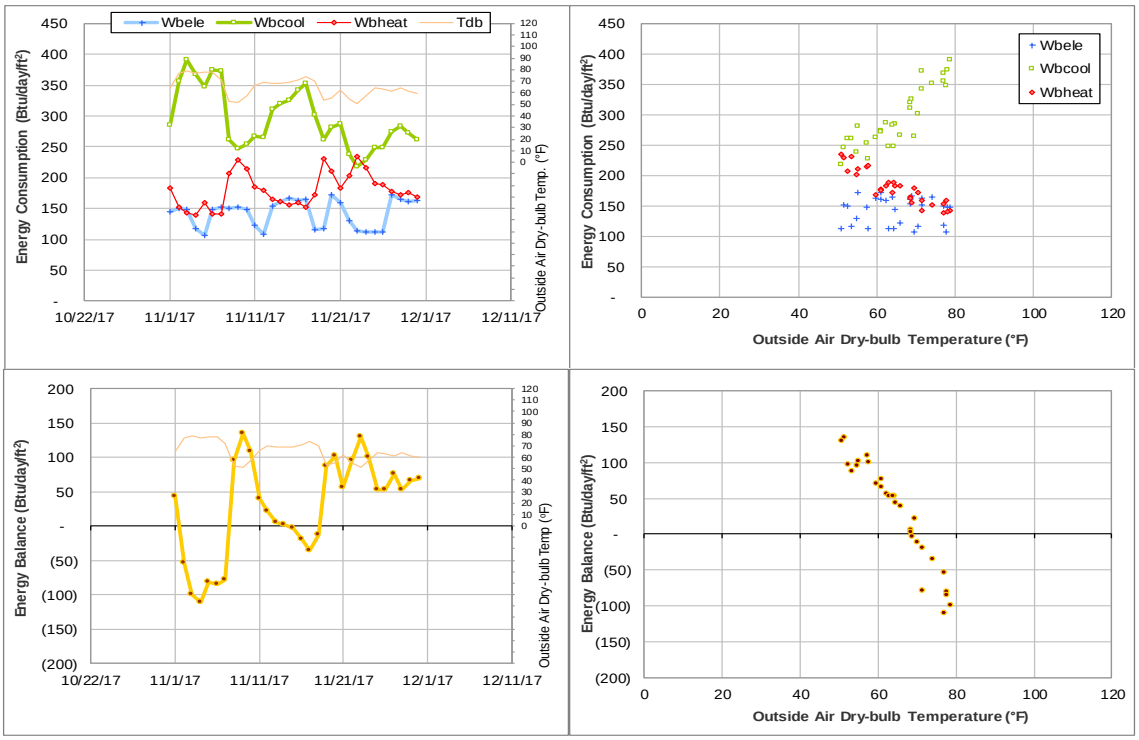


Figure IV-18 Sanders Corps of Cadets Center TAMU BLDG # 384 Energy Balance Plot during November 2017

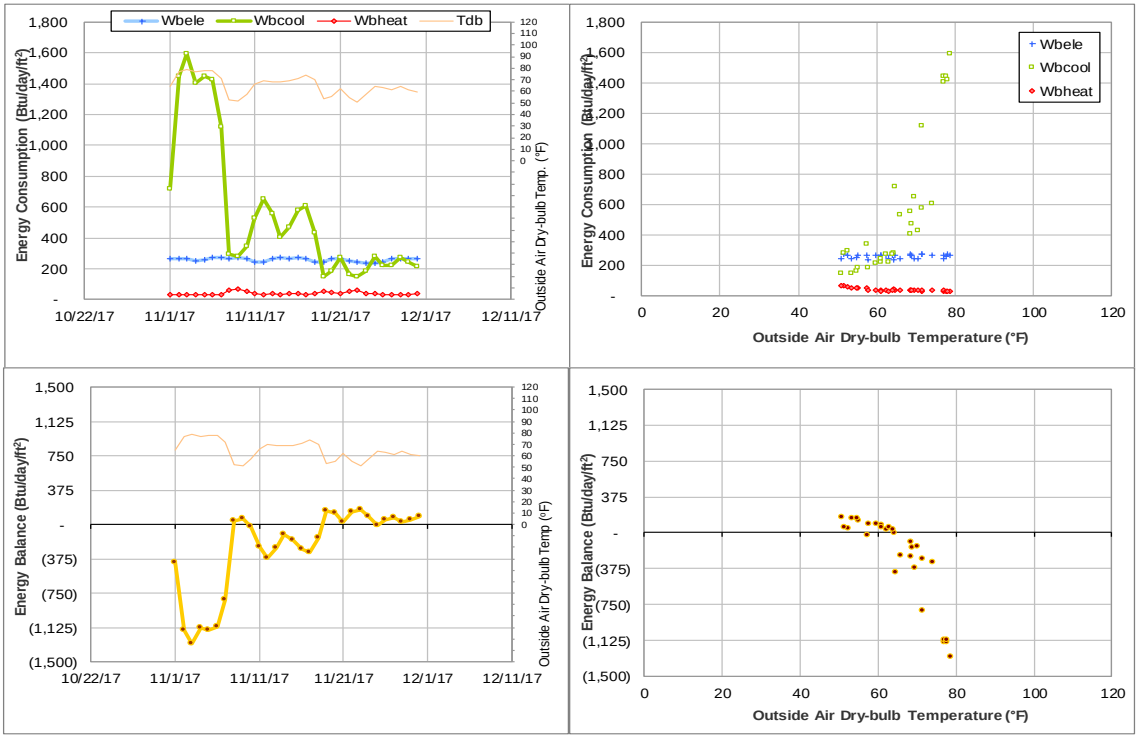


Figure IV-19 Jack E. Brown Chemical Engineering Building TAMU BLDG # 386 Energy Balance Plot during November 2017

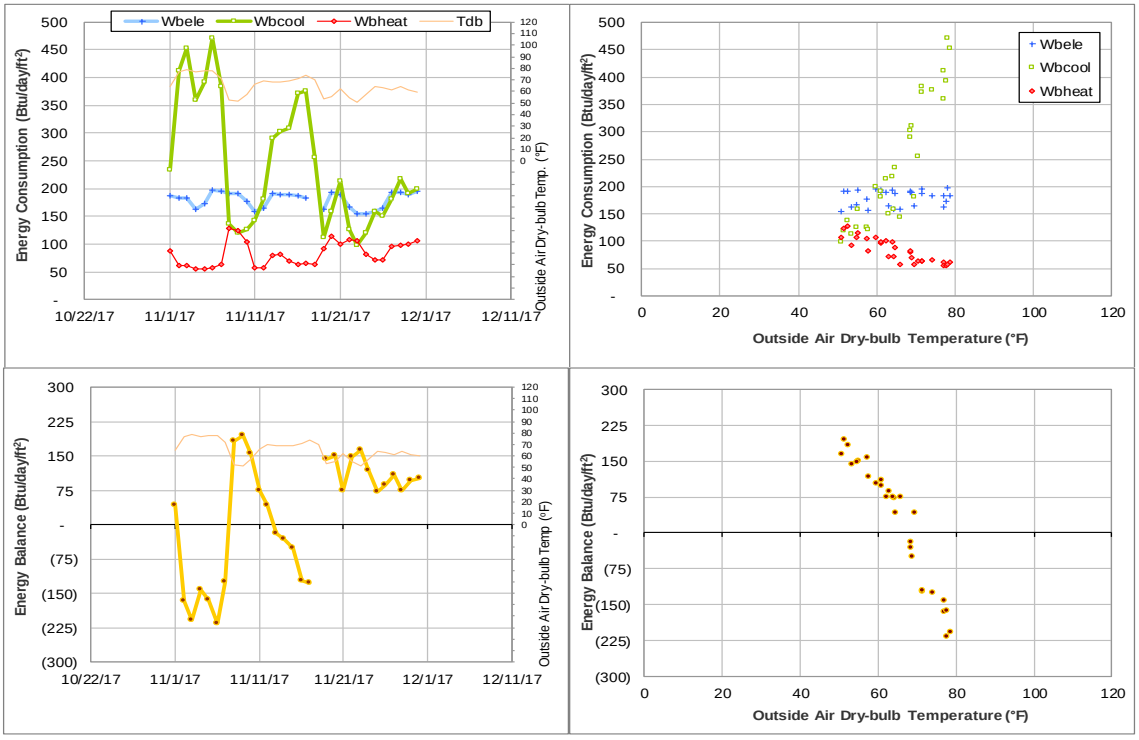


Figure IV-20 Richardson Petroleum Engineering Building TAMU BLDG # 387 Energy Balance Plot during November 2017

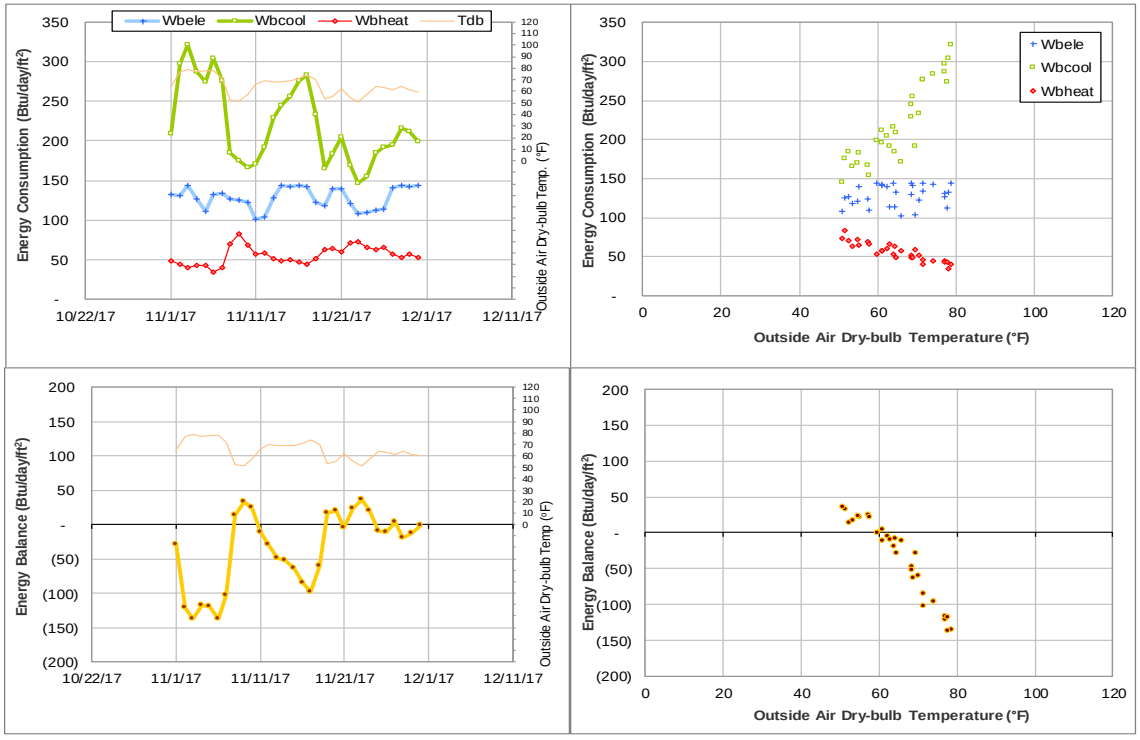


Figure IV-21 James J. Cain'51 and Mechanical Engineering Office Building TAMU BLDG # 391 Energy Balance Plot during November 2017

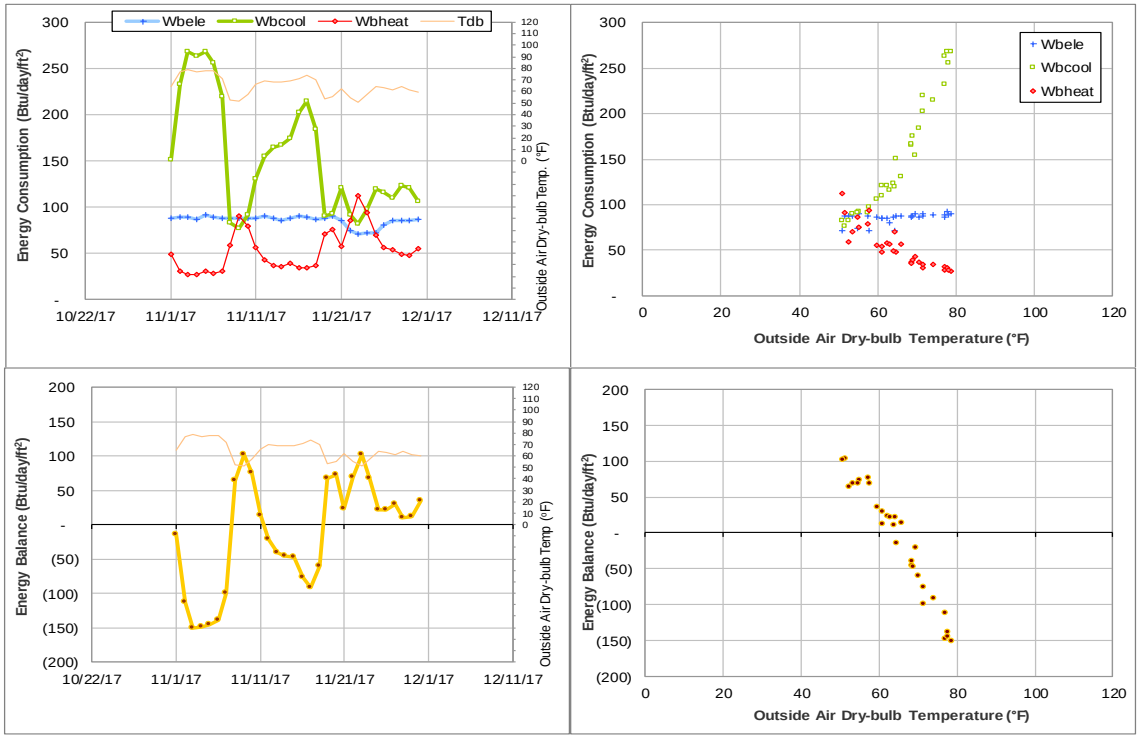


Figure IV-22 Underwood Residence Hall TAMU BLDG # 394 Energy Balance Plot during November 2017

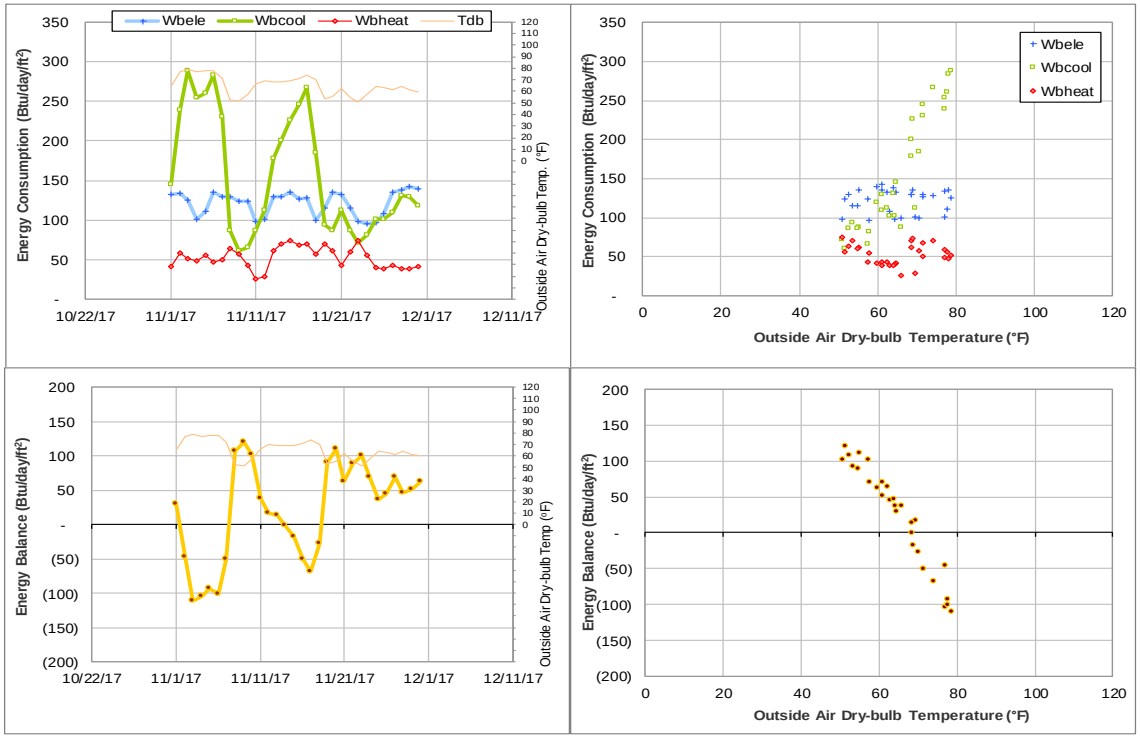


Figure IV-23 Langford Architecture Center Building A TAMU BLDG # 398 Energy Balance Plot during November 2017

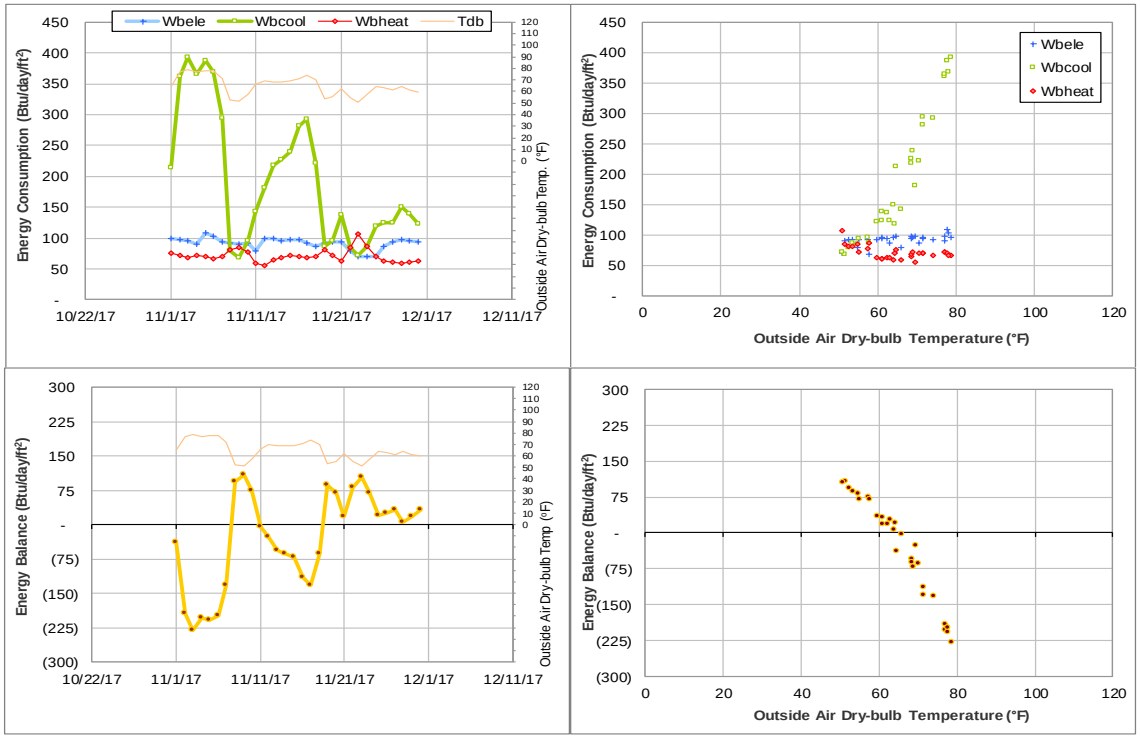


Figure IV-24 Spence Hall, Briggs Hall, and Ash II LLC TAMU BLDG # 400-402-1405 Energy Balance Plot during November 2017

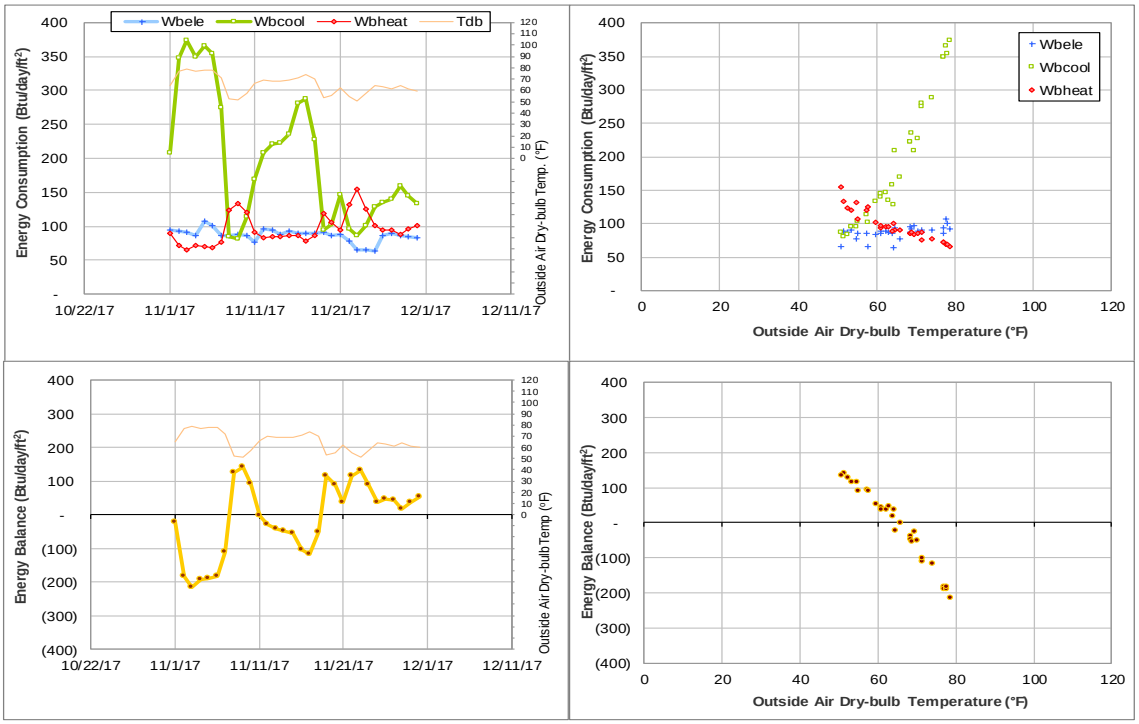


Figure IV-25 Spence Hall Dorm 1 TAMU BLDG # 400 Energy Balance Plot during November 2017

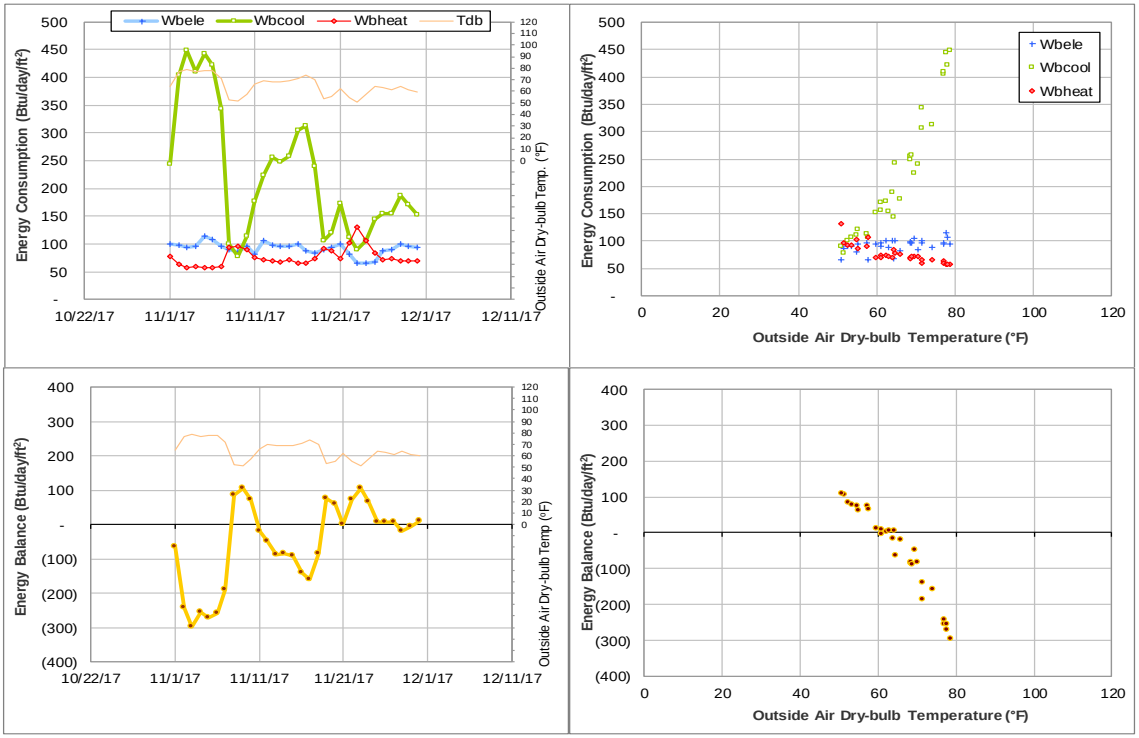


Figure IV-26 Briggs Hall Dorm 3 TAMU BLDG # 402 Energy Balance Plot during November 2017

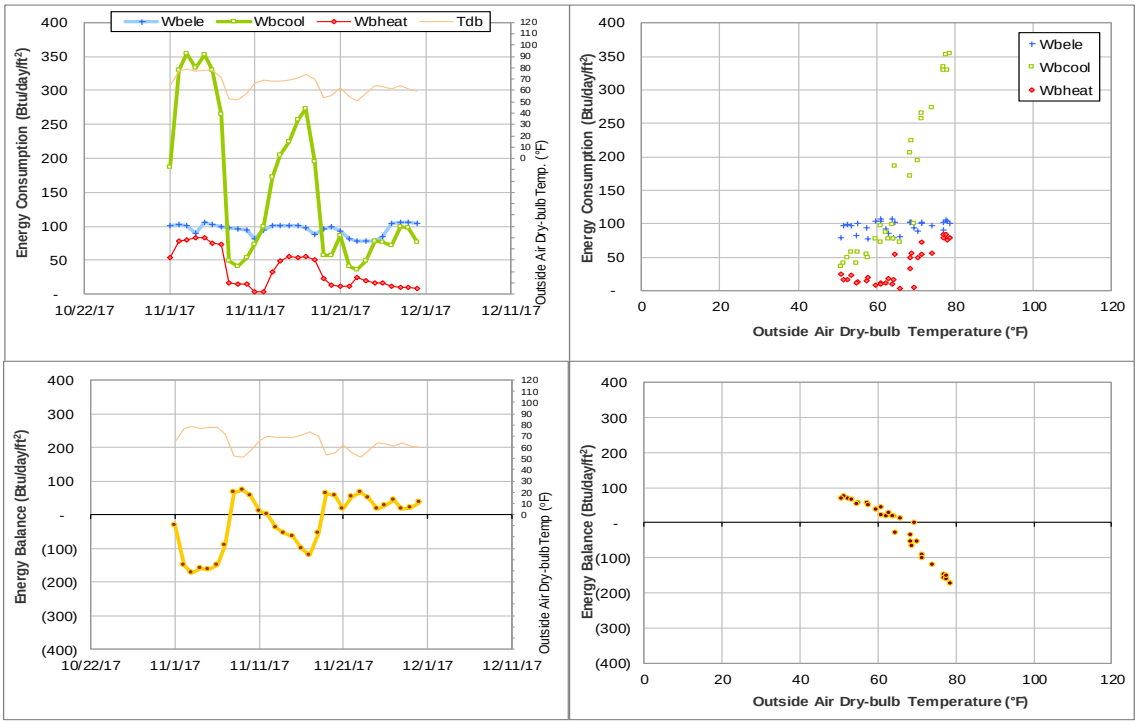


Figure IV-27 Ash II LLC TAMU BLDG # 1405 Energy Balance Plot during November 2017

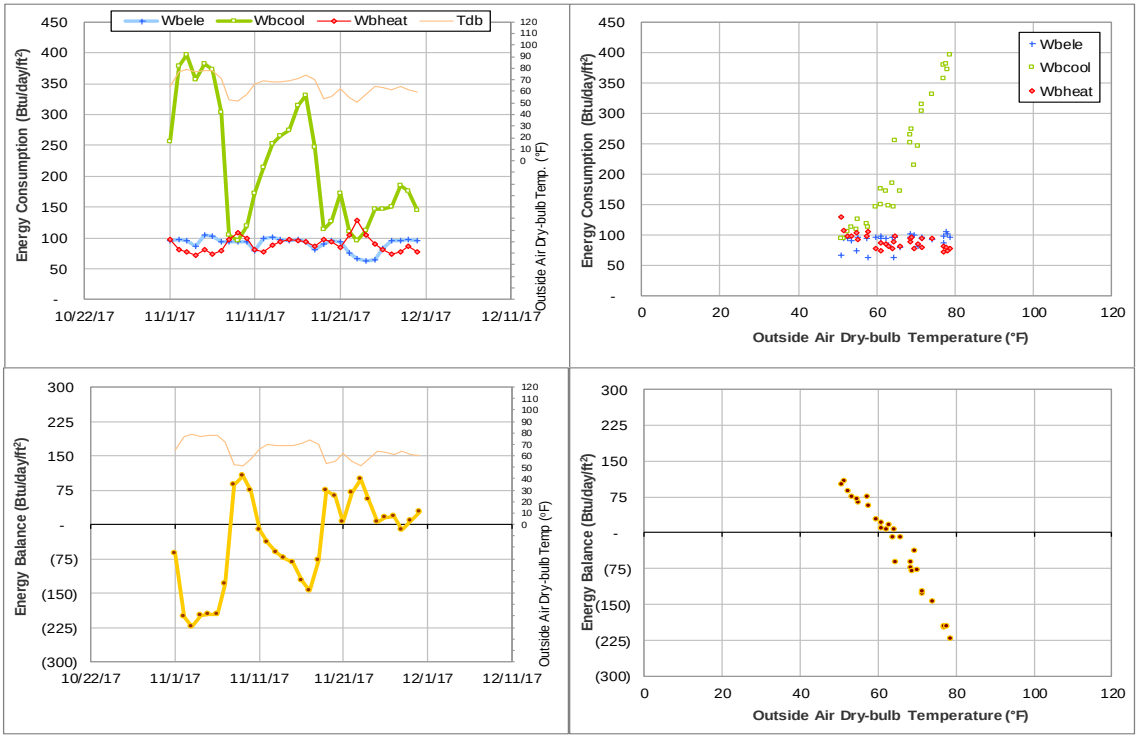


Figure IV-28 Kiest Hall, Fountain Hall, and Plank LLC TAMU BLDG # 401-403-1404 Energy Balance Plot during November 2017

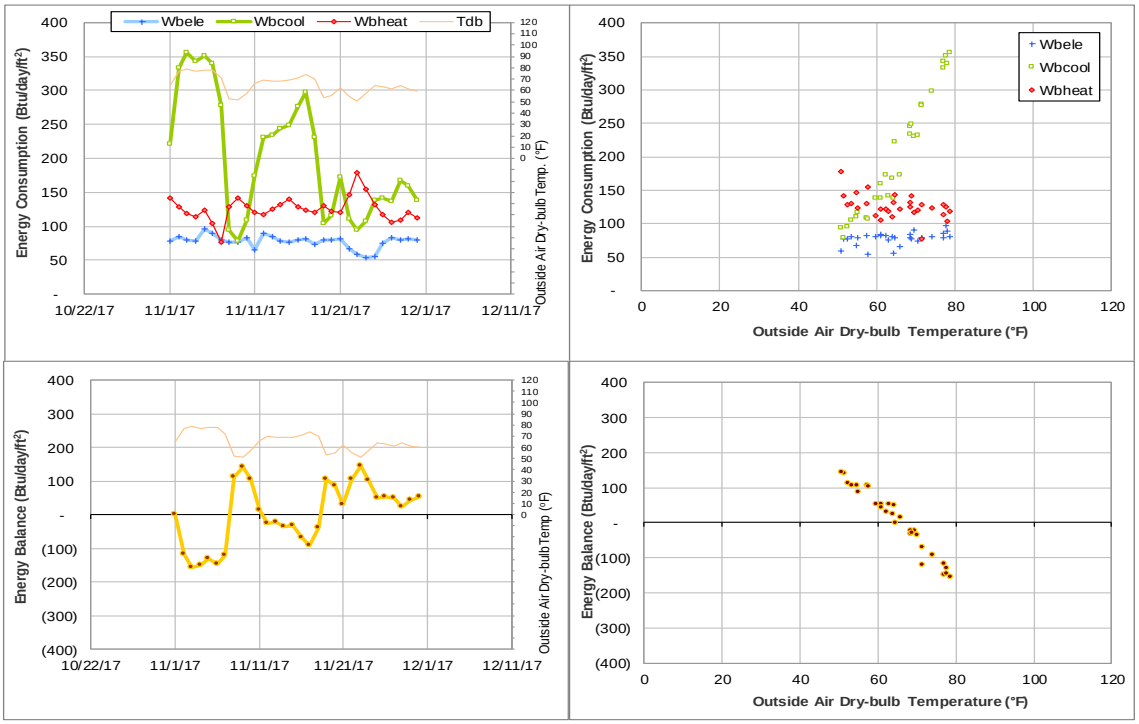


Figure IV-29 Kiest Hall Dorm 2 TAMU BLDG # 401 Energy Balance Plot during November 2017

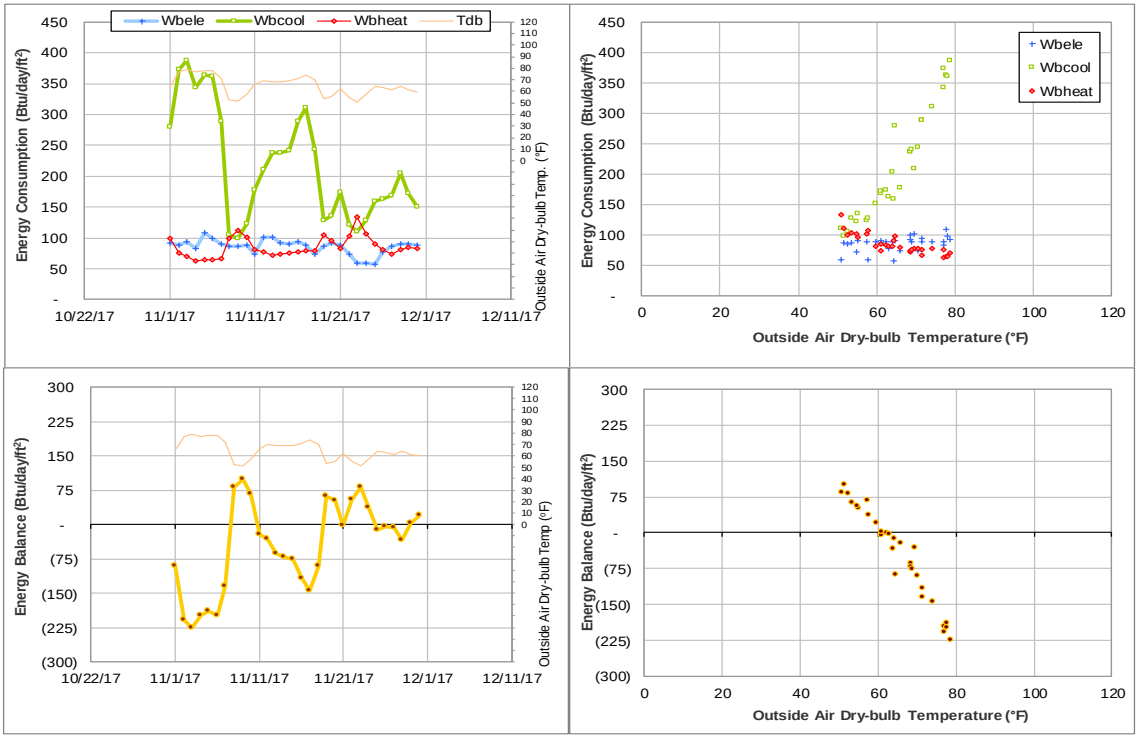


Figure IV-30 Fountain Hall Dorm 4 TAMU BLDG # 403 Energy Balance Plot during November 2017

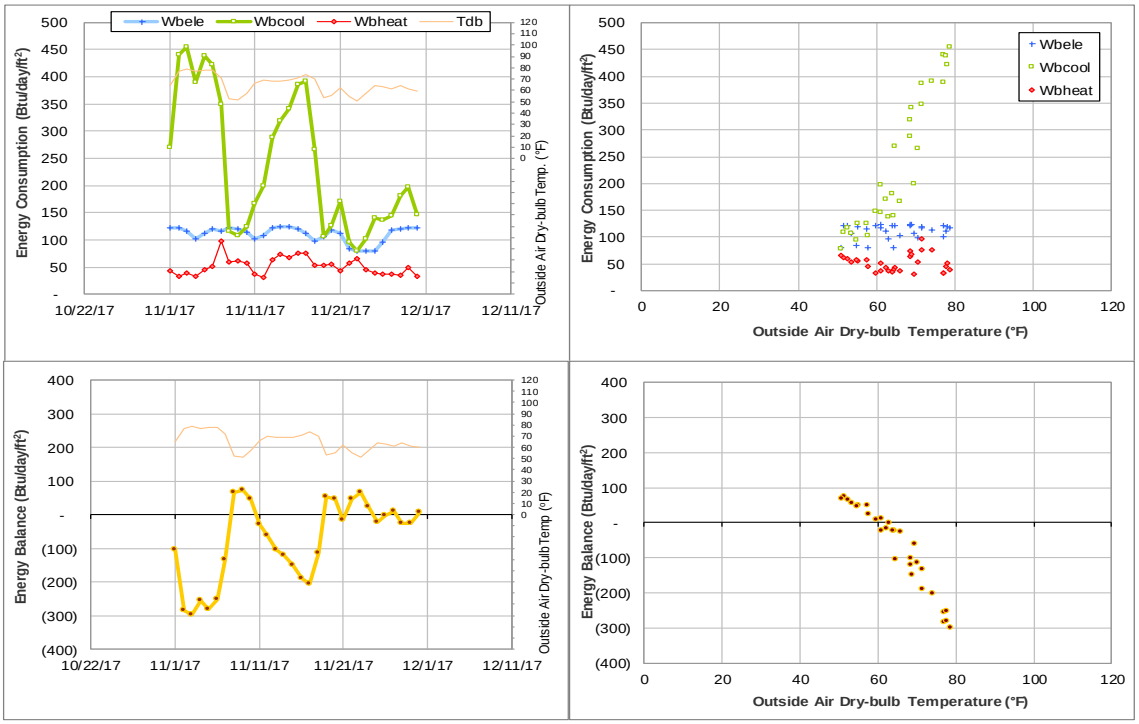


Figure IV-31 Plank LLC TAMU BLDG # 1404 Energy Balance Plot during November 2017

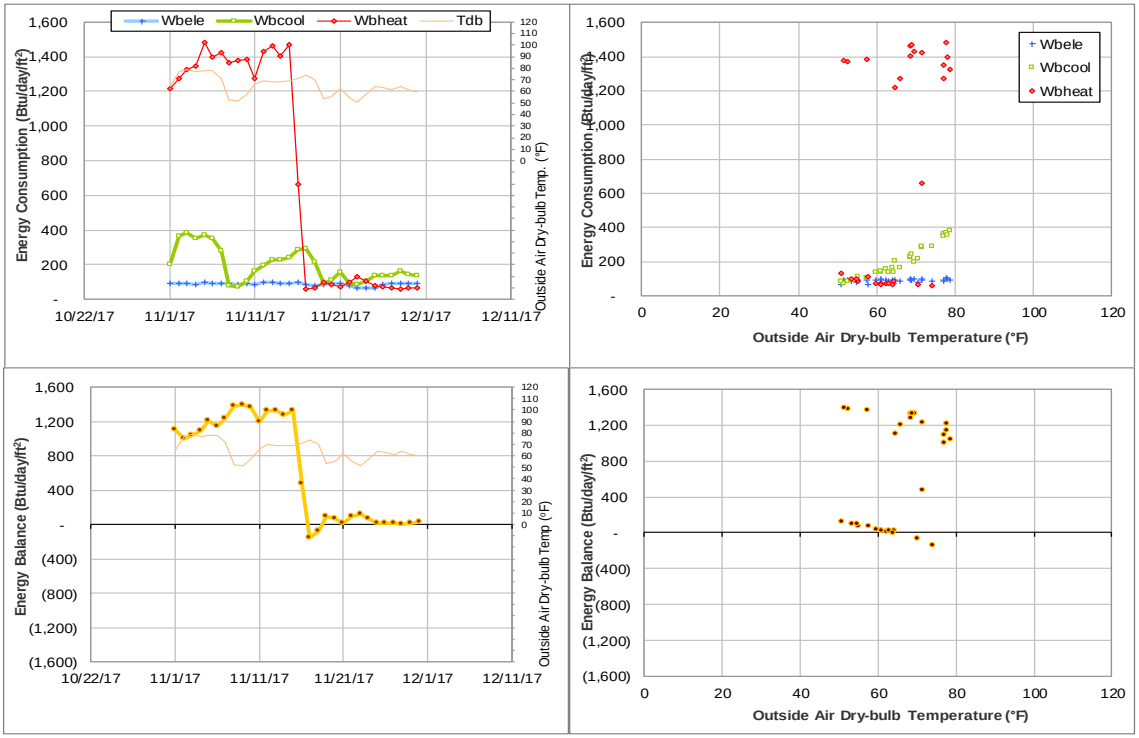


Figure IV-32 Gainer Hall, Leonard Hall and Ash LLC TAMU BLDG # 404-406-1403 Energy Balance Plot during November 2017

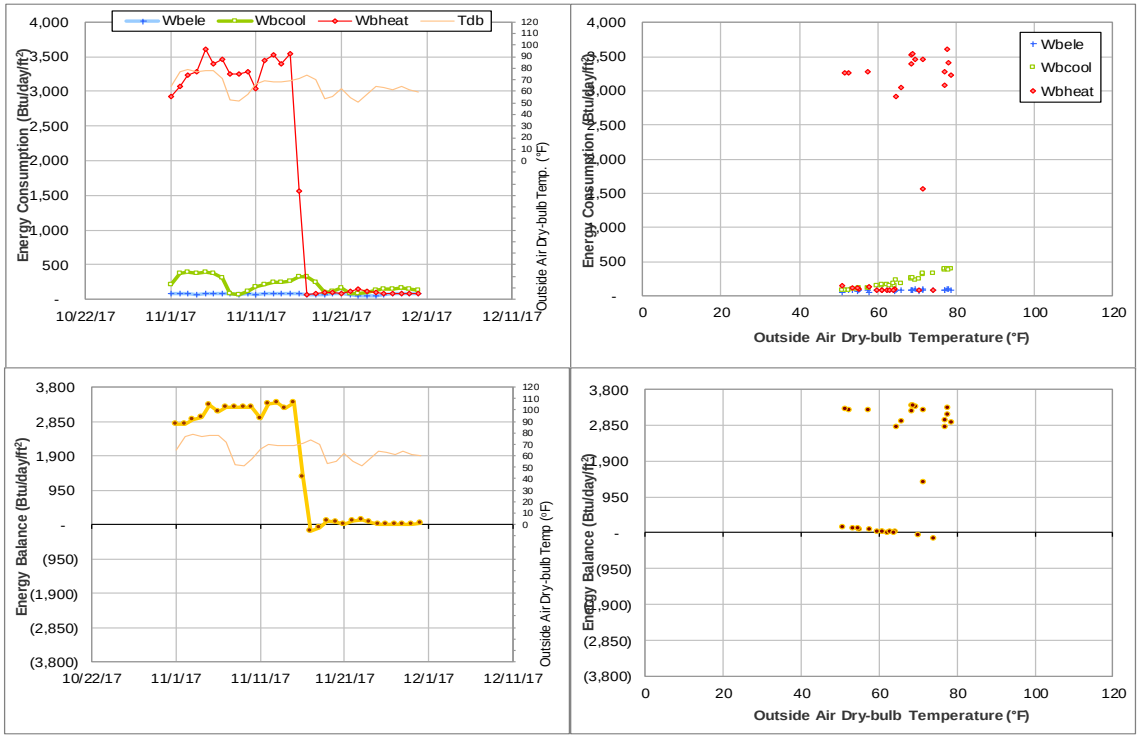


Figure IV-33 Gainer Hall Dorm 5 TAMU BLDG # 404 Energy Balance Plot during November 2017

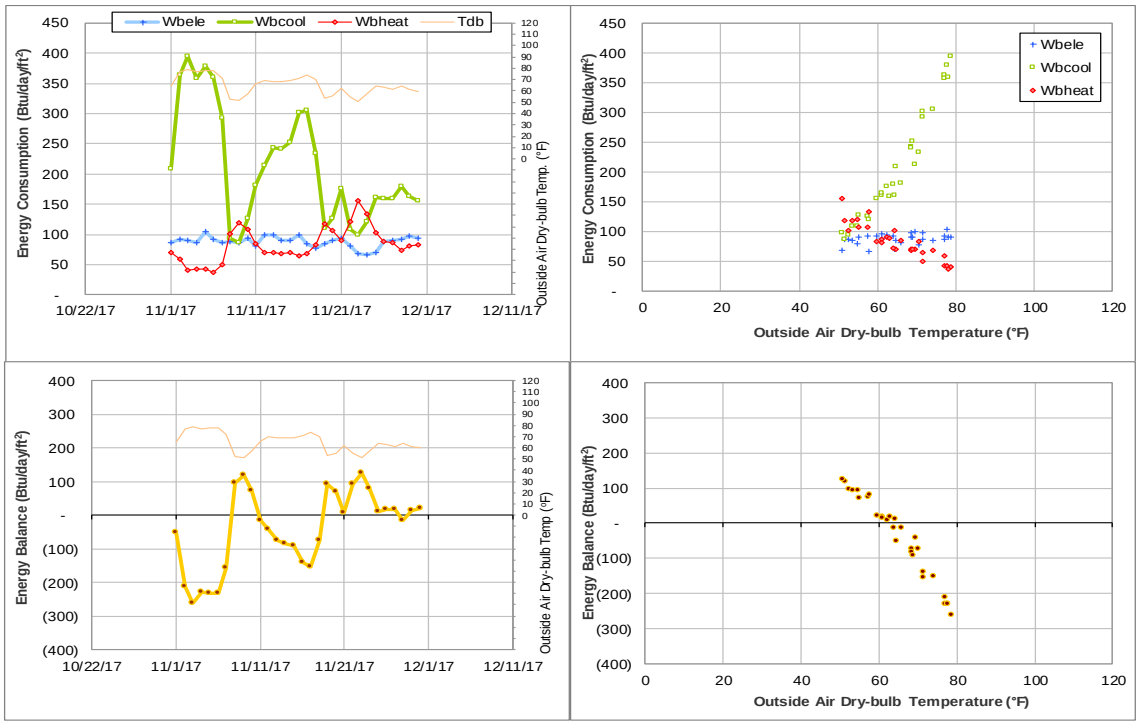


Figure IV-34 Leonard Hall - Dorm 7 TAMU BLDG # 406 Energy Balance Plot during November 2017

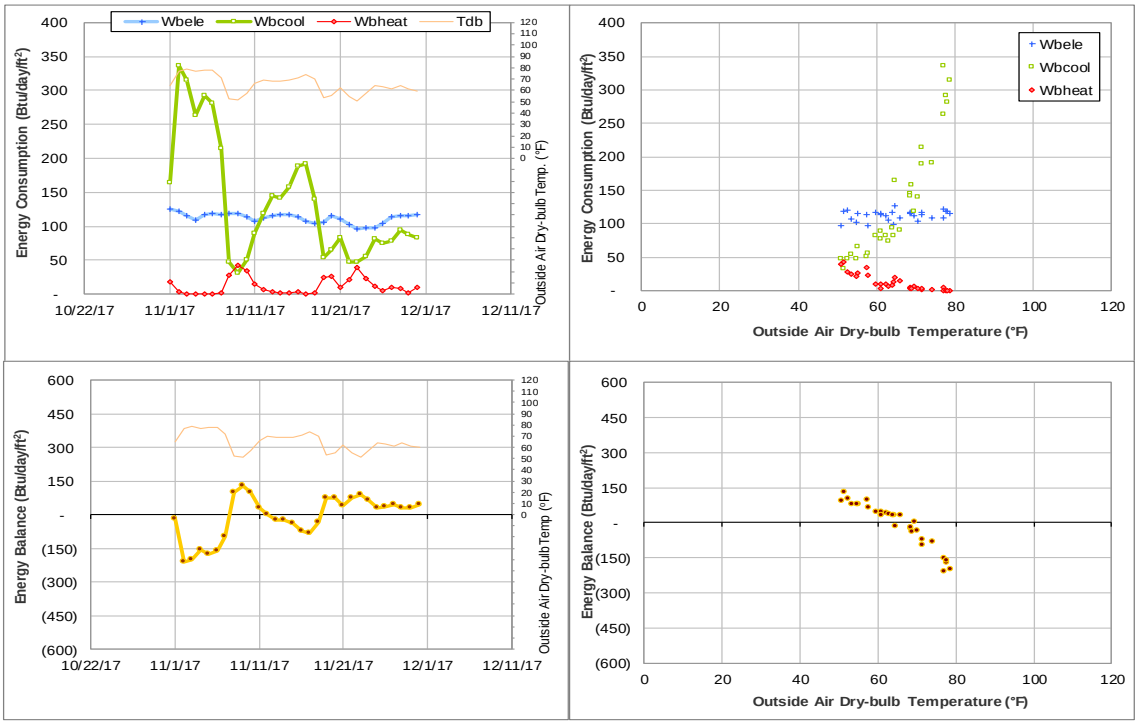


Figure IV-35 H. Grady Ash, Jr. '58 Leadership Learning Center TAMU BLDG # 1403 Energy Balance Plot during November 2017

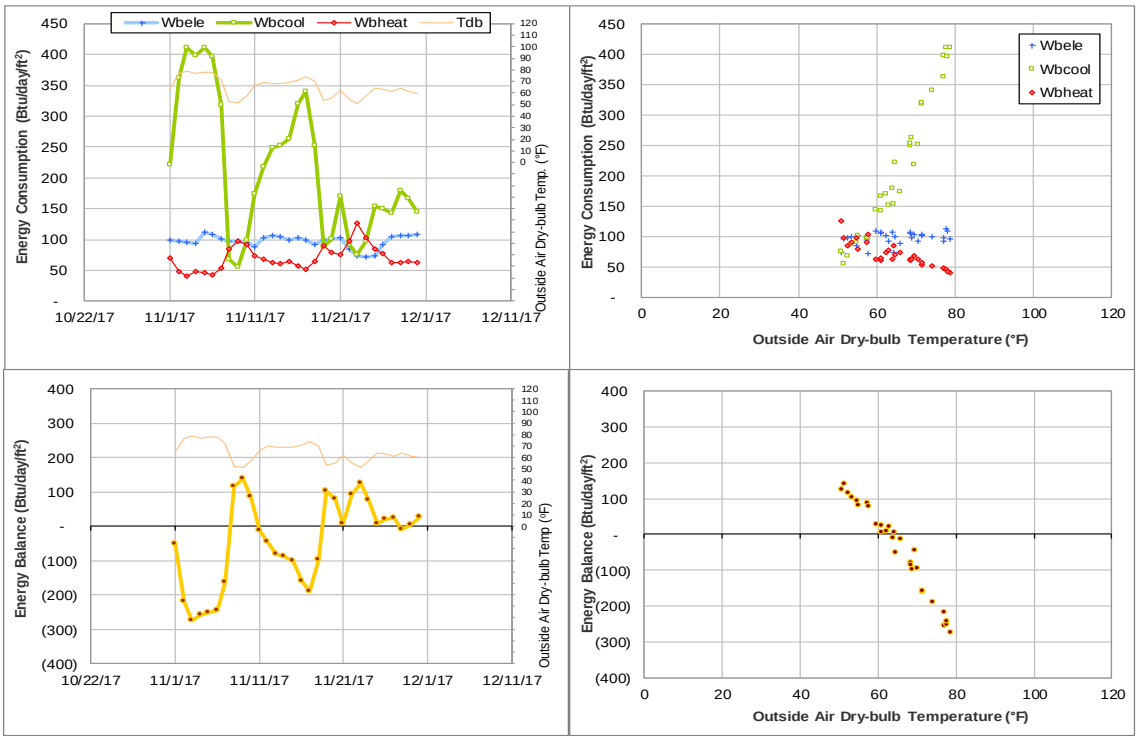


Figure IV-36 Lacy Hall - Dorm 6, Harrell Hall and Leadership Learning Center TAMU BLDG # 405-407-1402 Energy Balance Plot during November 2017

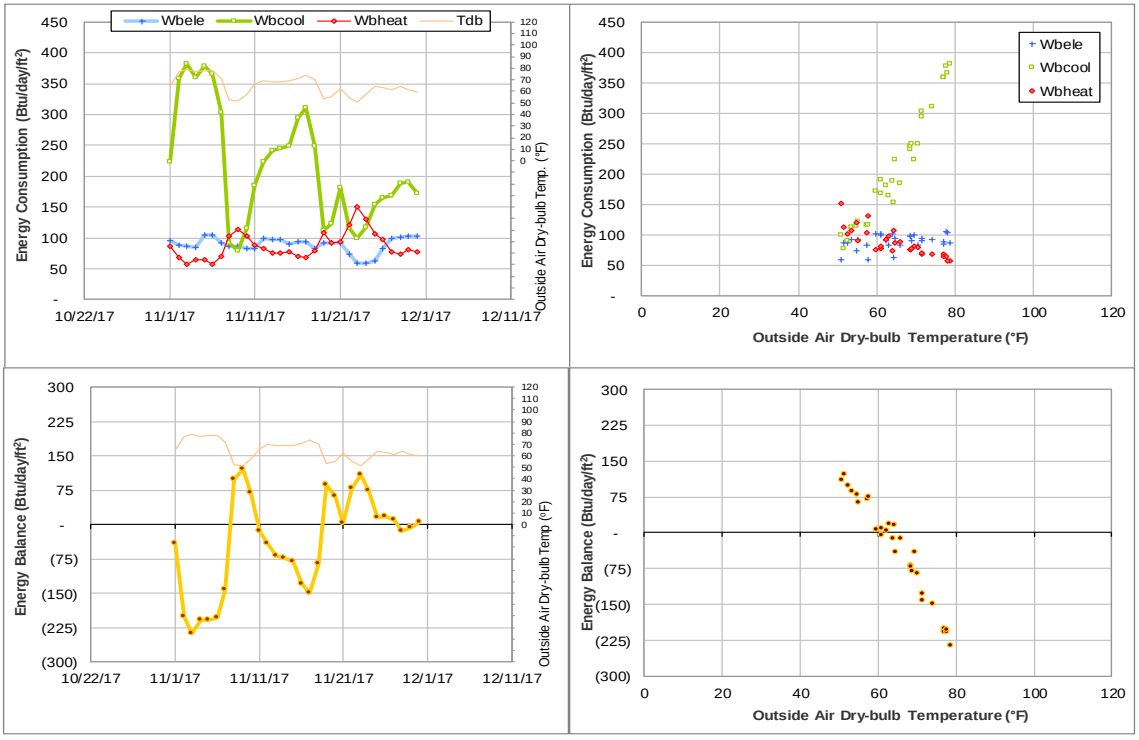


Figure IV-37 Lacy Hall - Dorm 6 TAMU BLDG # 405 Energy Balance Plot during November 2017

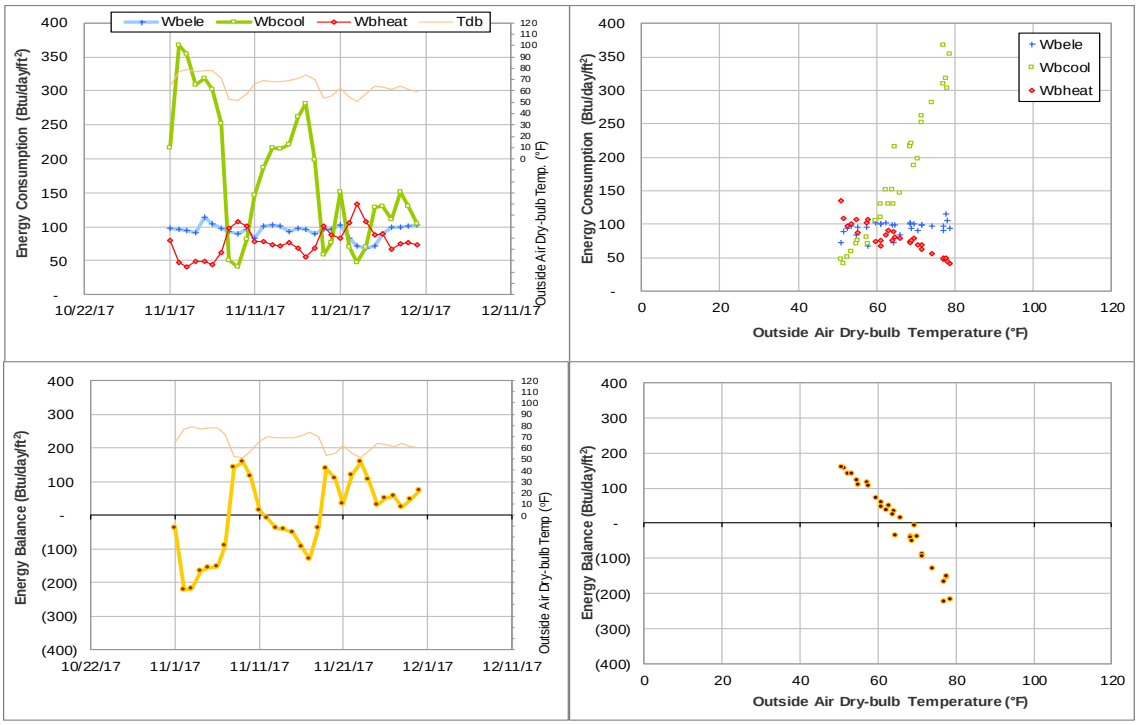


Figure IV-38 Harrell Hall - Dorm 8 TAMU BLDG # 407 Energy Balance Plot during November 2017

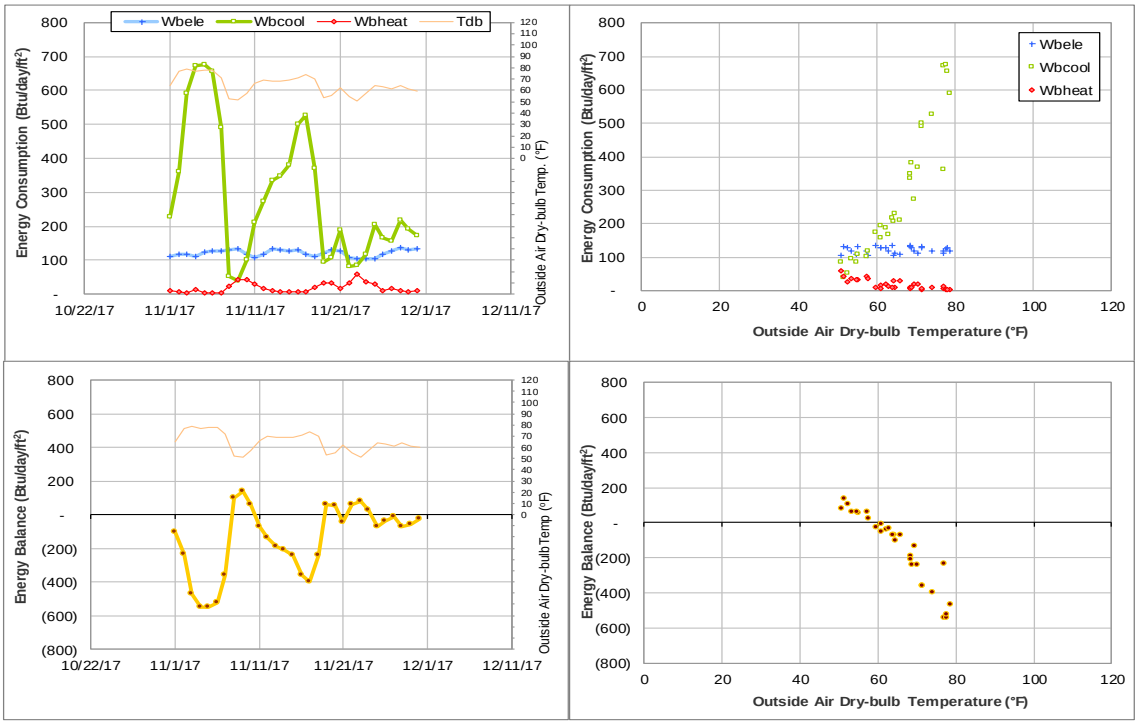


Figure IV-39 Buzbee Leadership Learning Center TAMU BLDG # 1402 Energy Balance Plot during November 2017

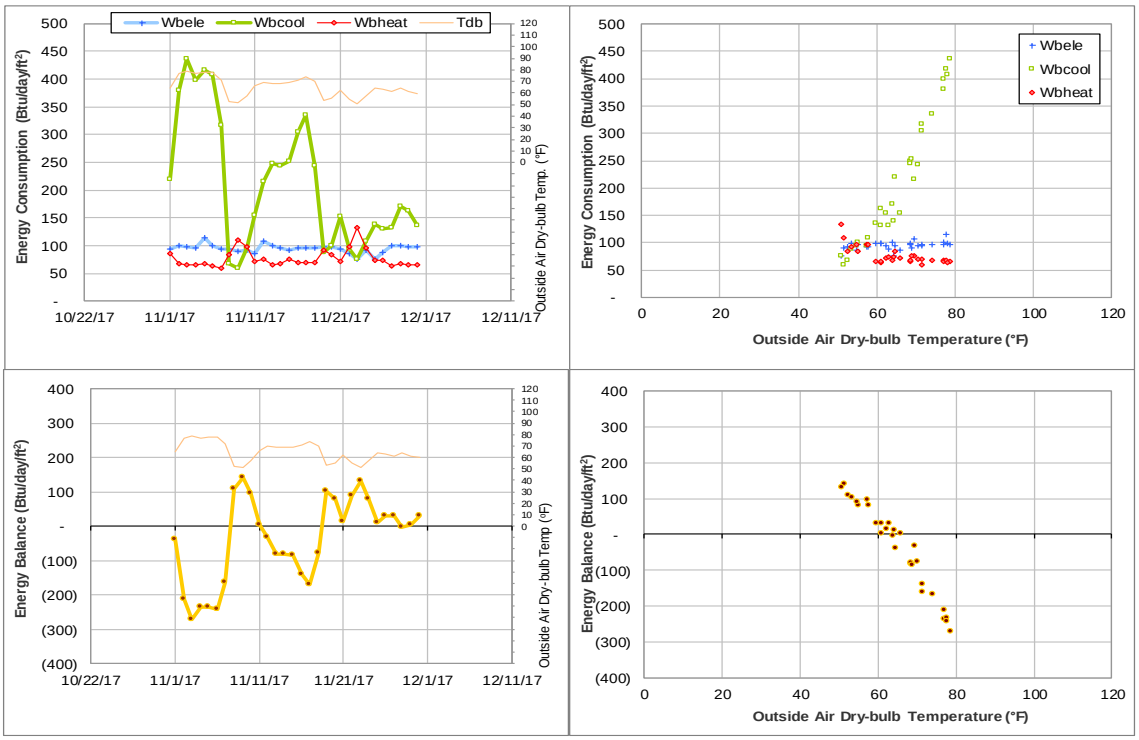


Figure IV-40 Whitely Hall - Dorm 9 TAMU BLDG # 408 Energy Balance Plot during November 2017

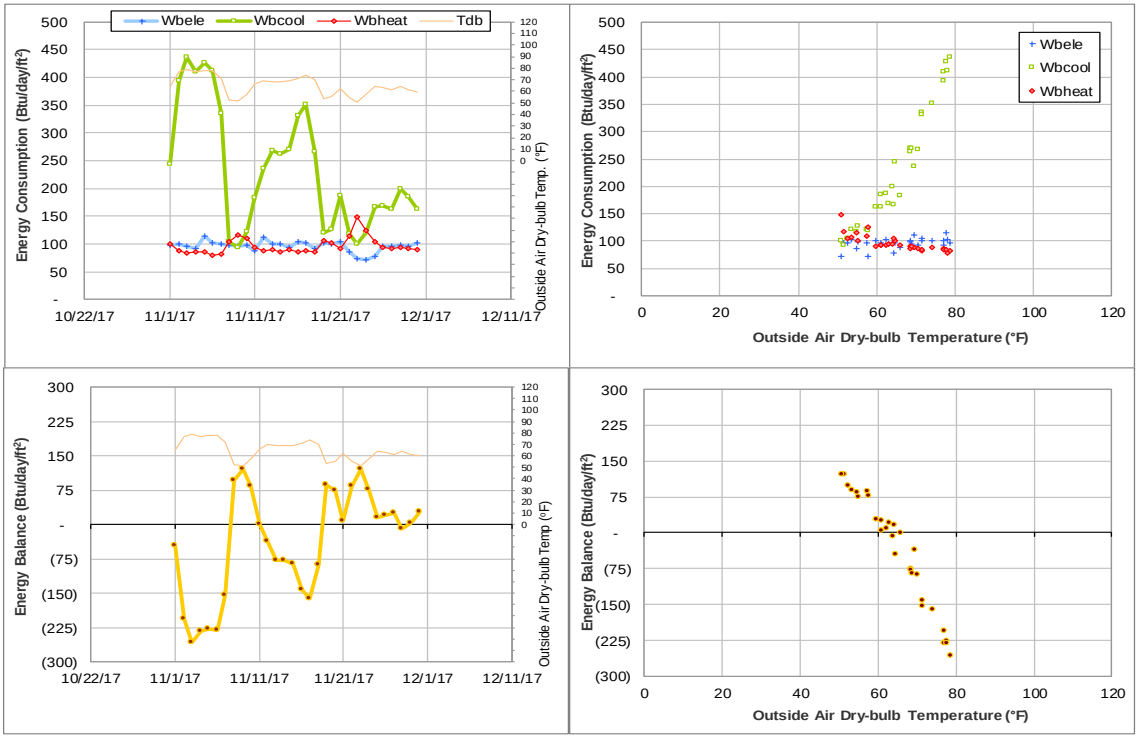


Figure IV-41 White Hall - Dorm 10 TAMU BLDG # 409 Energy Balance Plot during November 2017

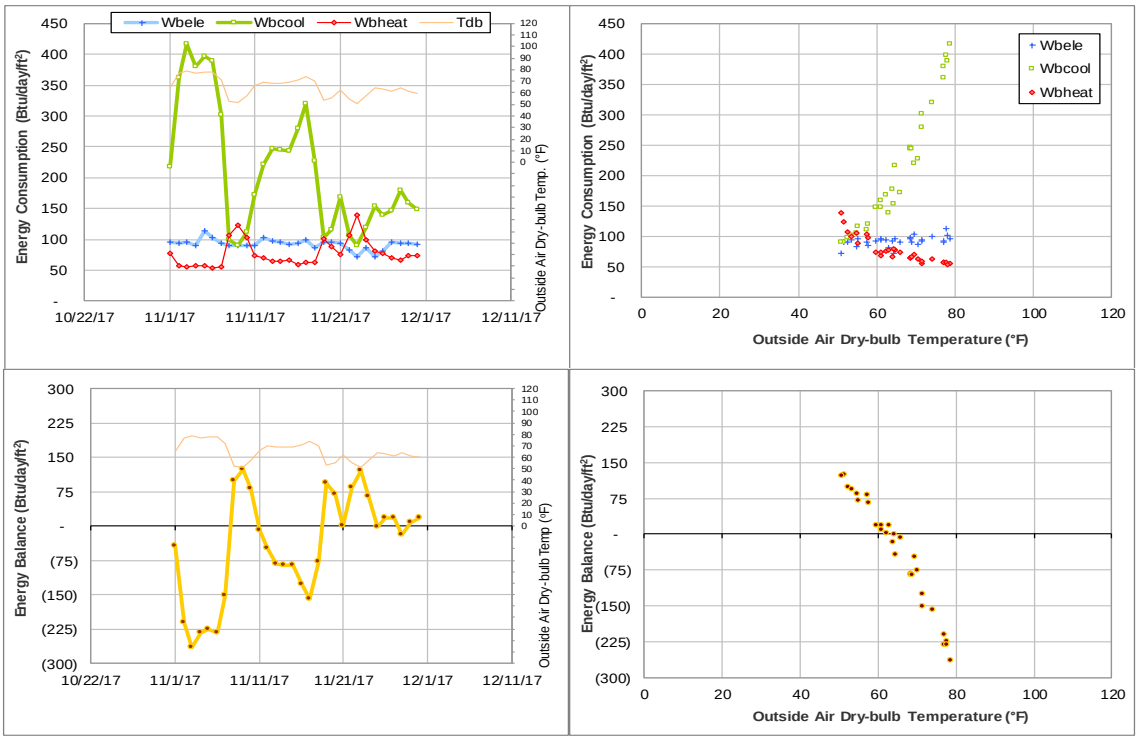


Figure IV-42 Harrington Hall - Dorm 11 TAMU BLDG # 410 Energy Balance Plot during November 2017

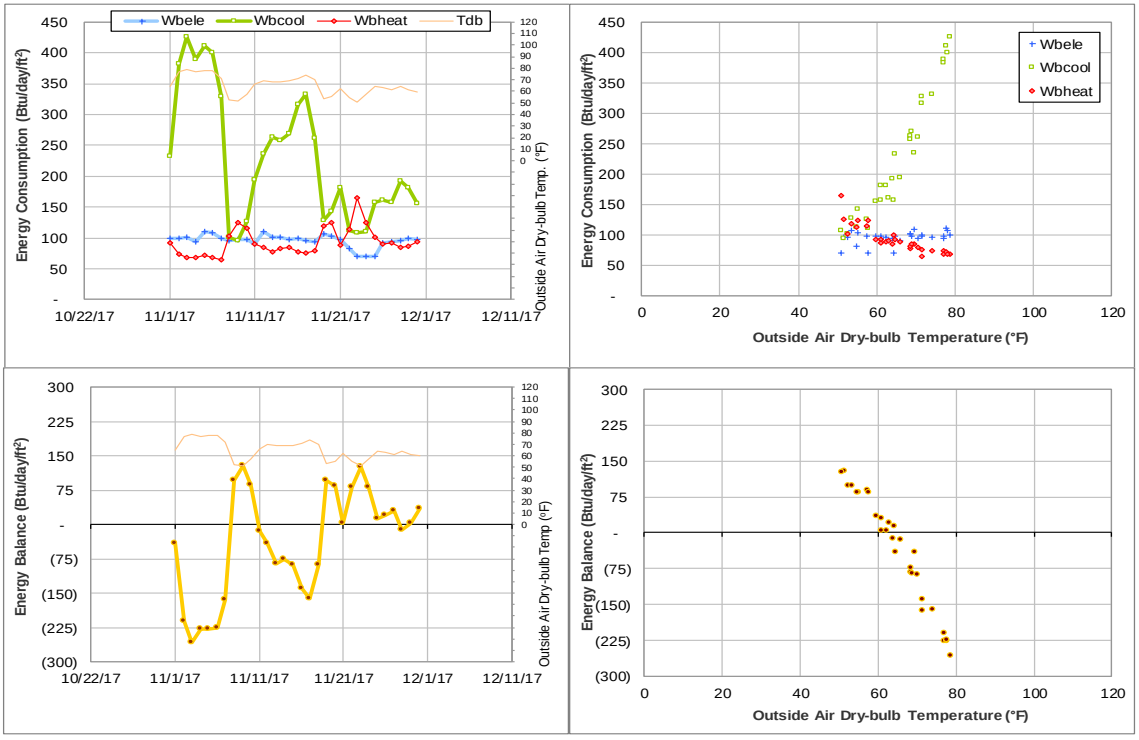


Figure IV-43 Utay Hall - Dorm 12 TAMU BLDG # 411 Energy Balance Plot during November 2017

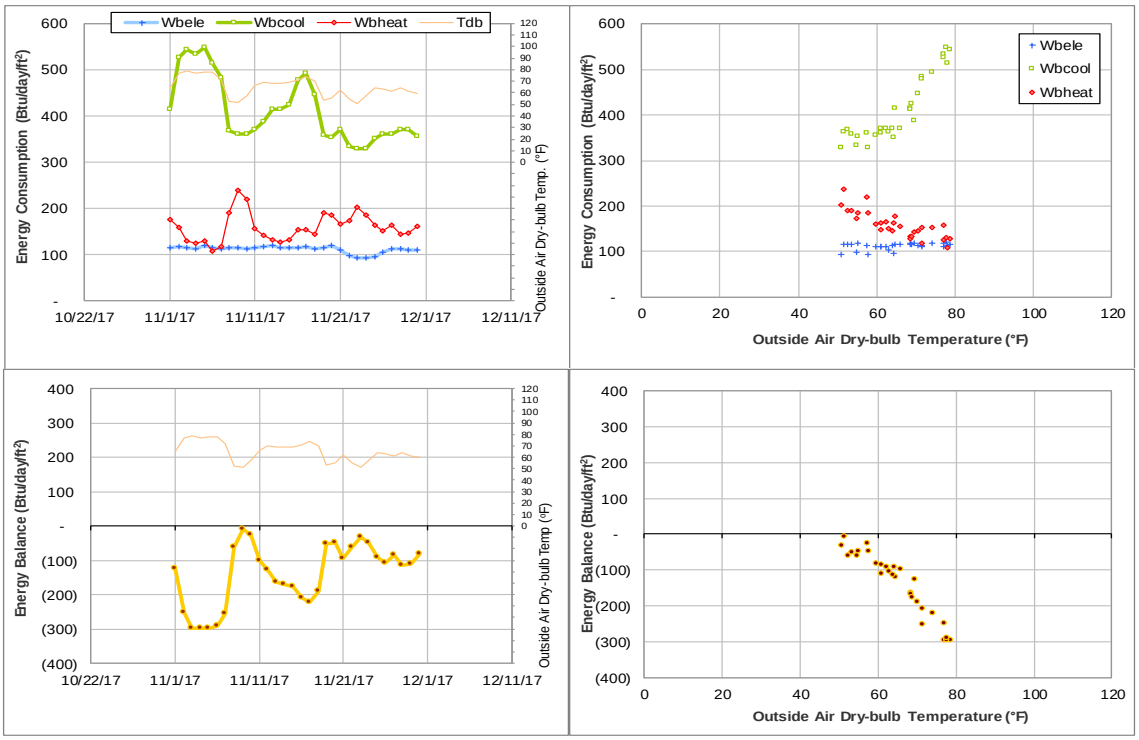


Figure IV-44 Moses Residence Hall TAMU BLDG # 412 Energy Balance Plot during November 2017

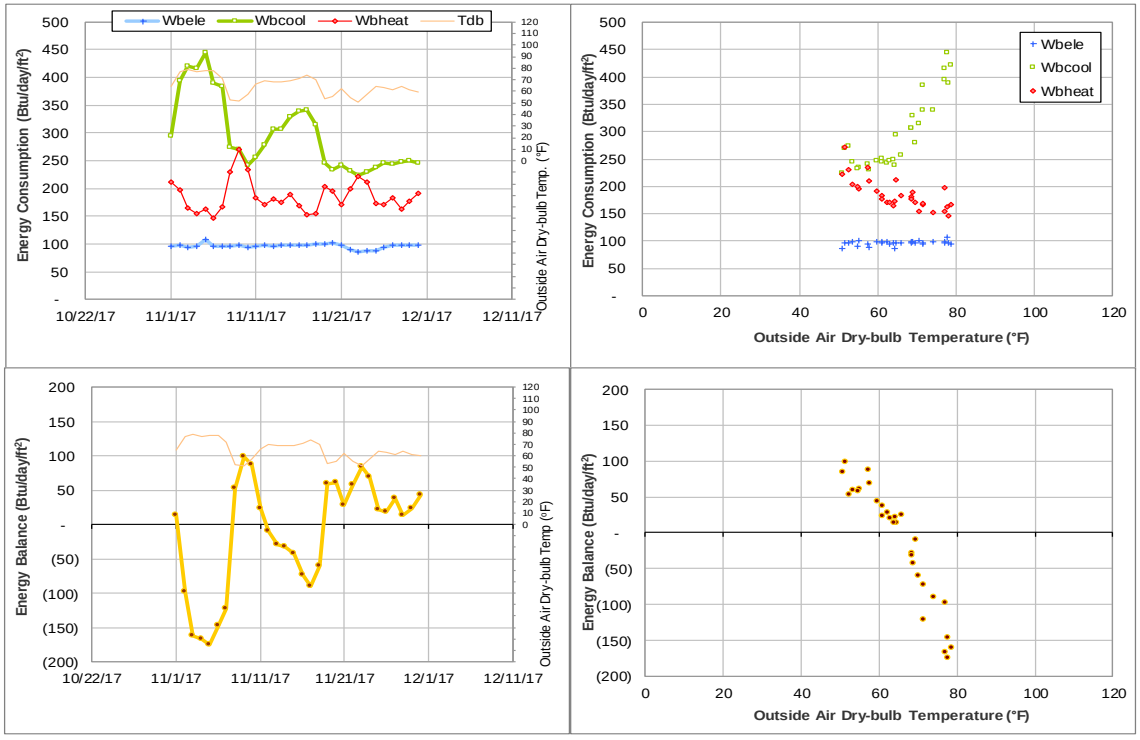


Figure IV-45 Davis-Gary Residence Hall TAMU BLDG # 415 Energy Balance Plot during November 2017

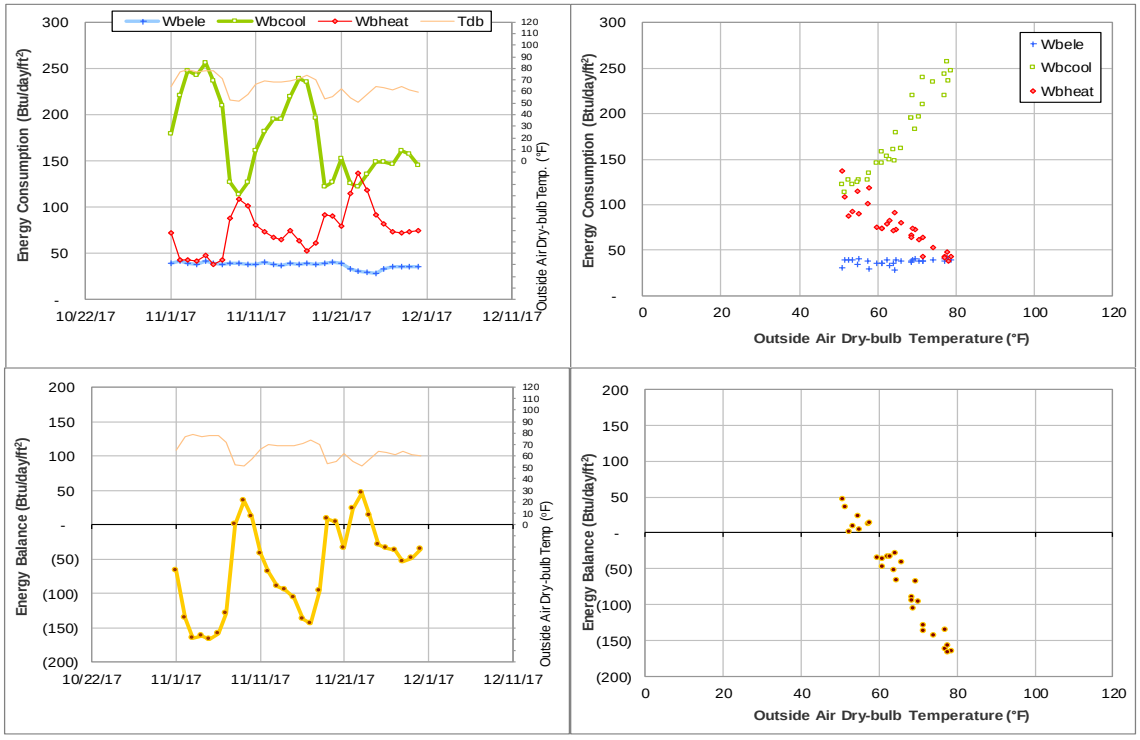


Figure IV-46 Legett Residence Hall TAMU BLDG # 419 Energy Balance Plot during November 2017

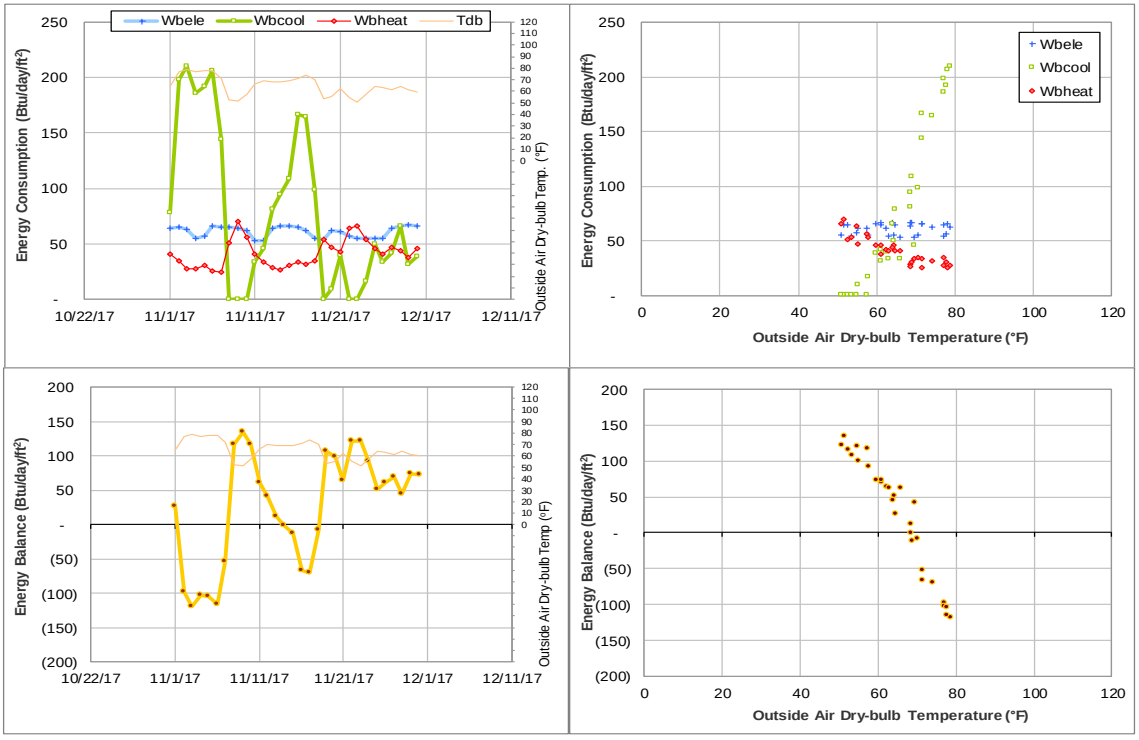


Figure IV-47 Milner Hall TAMU BLDG # 420 Energy Balance Plot during November 2017

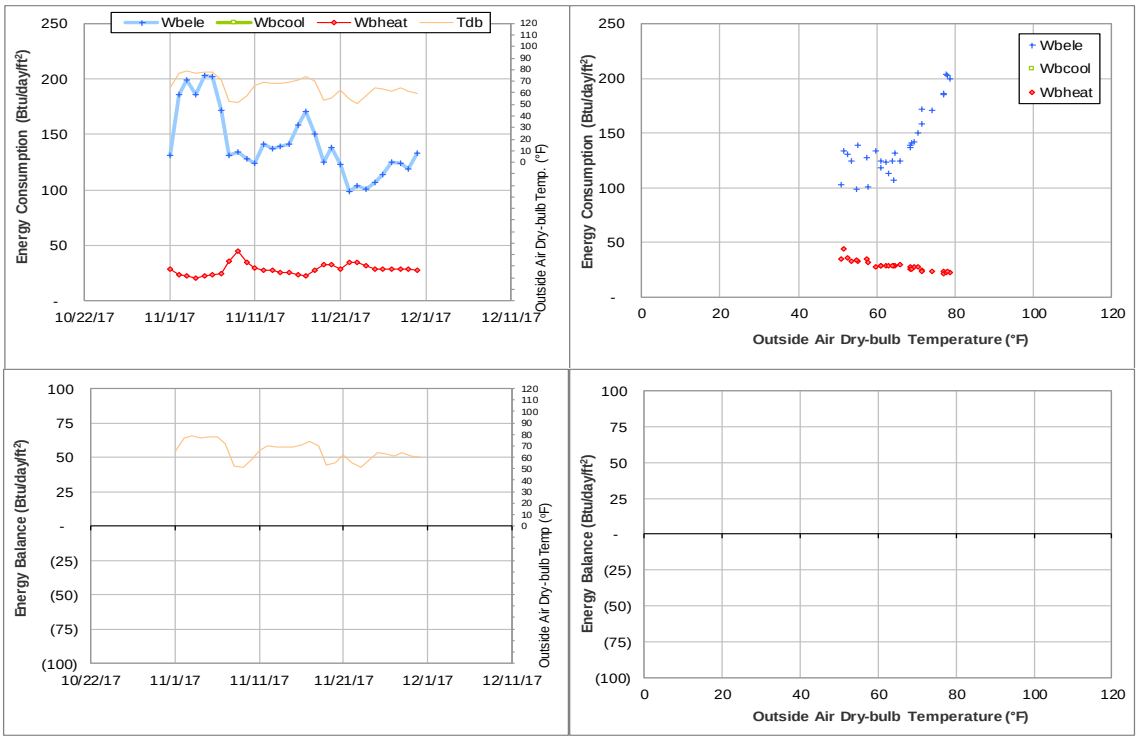


Figure IV-48 Walton Residence Hall TAMU BLDG # 422 Energy Balance Plot during November 2017

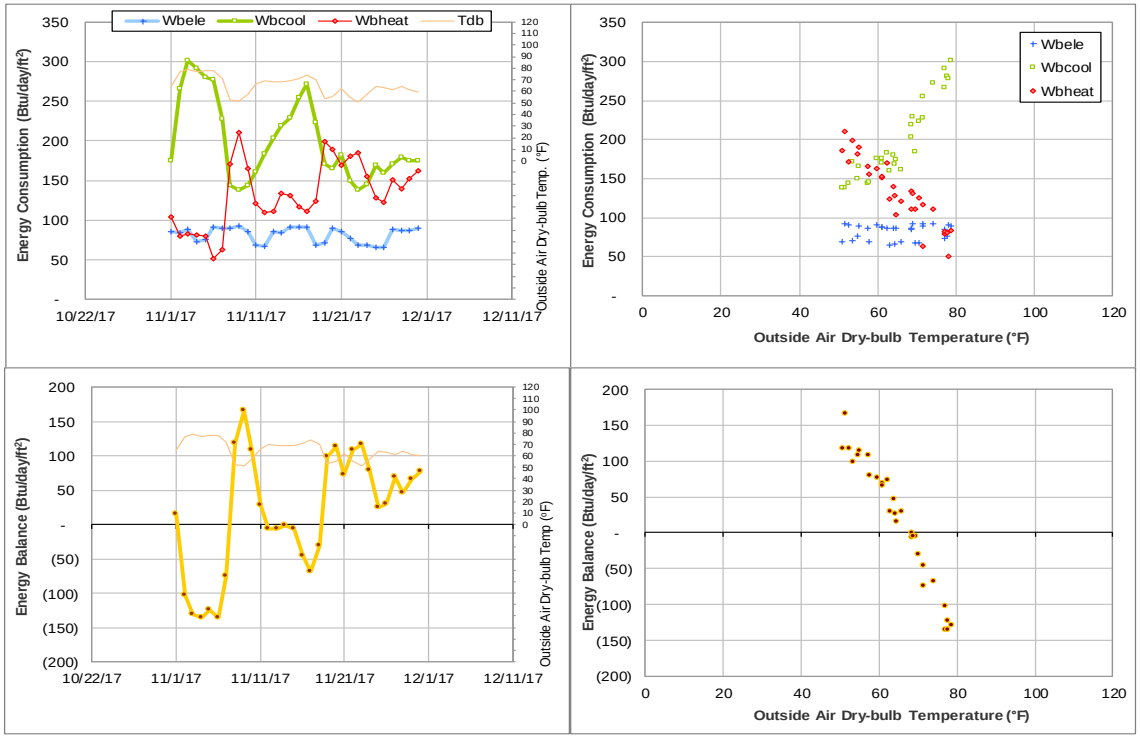


Figure IV-49 Hotard Hall TAMU BLDG # 424 Energy Balance Plot during November 2017

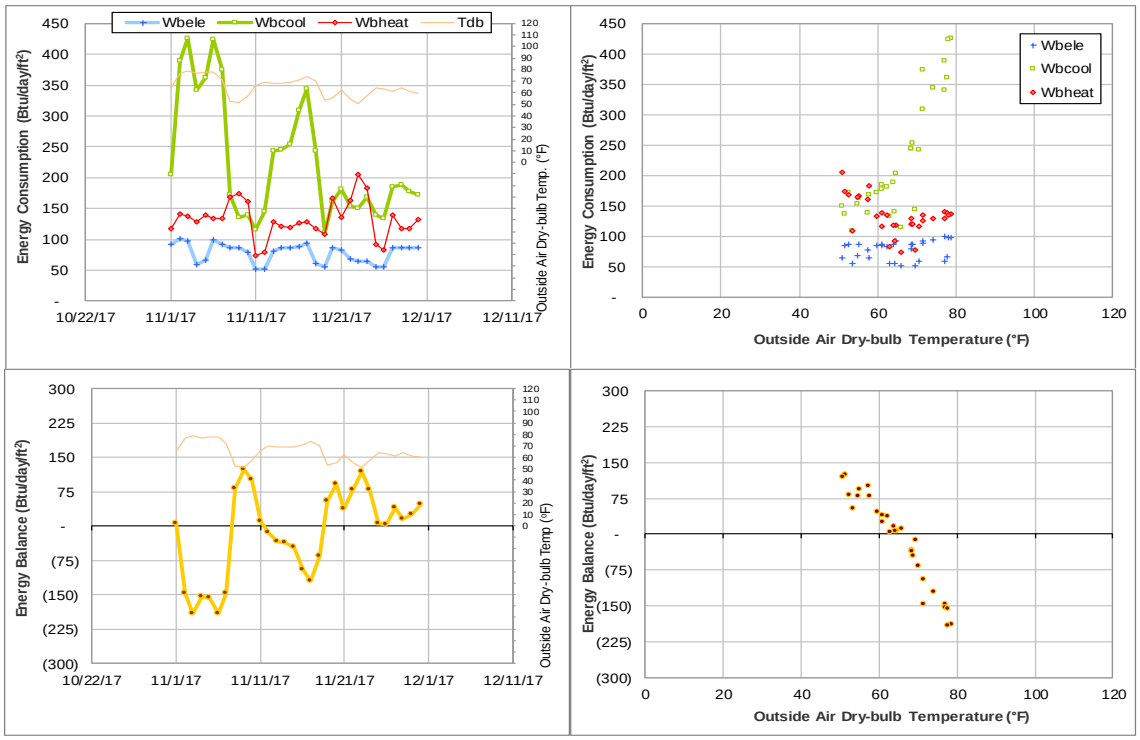


Figure IV-50 Henderson Hall TAMU BLDG # 425 Energy Balance Plot during November 2017

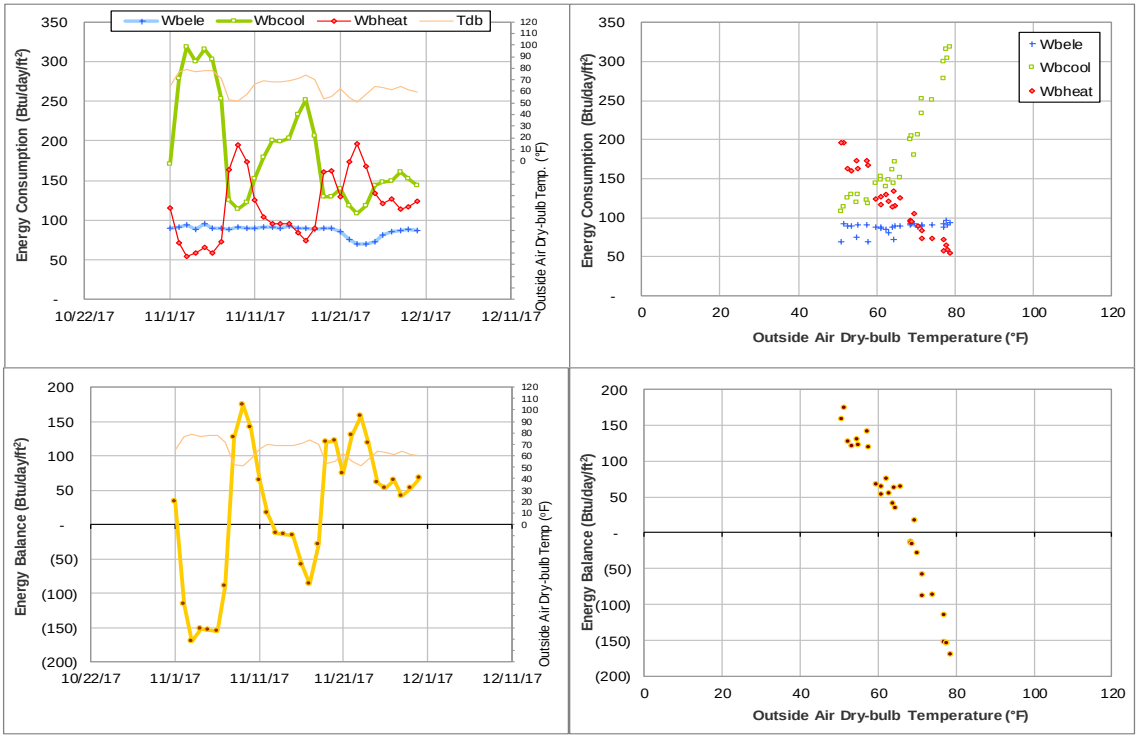


Figure IV-51 FHK Complex TAMU BLDG # 426 Energy Balance Plot during November 2017

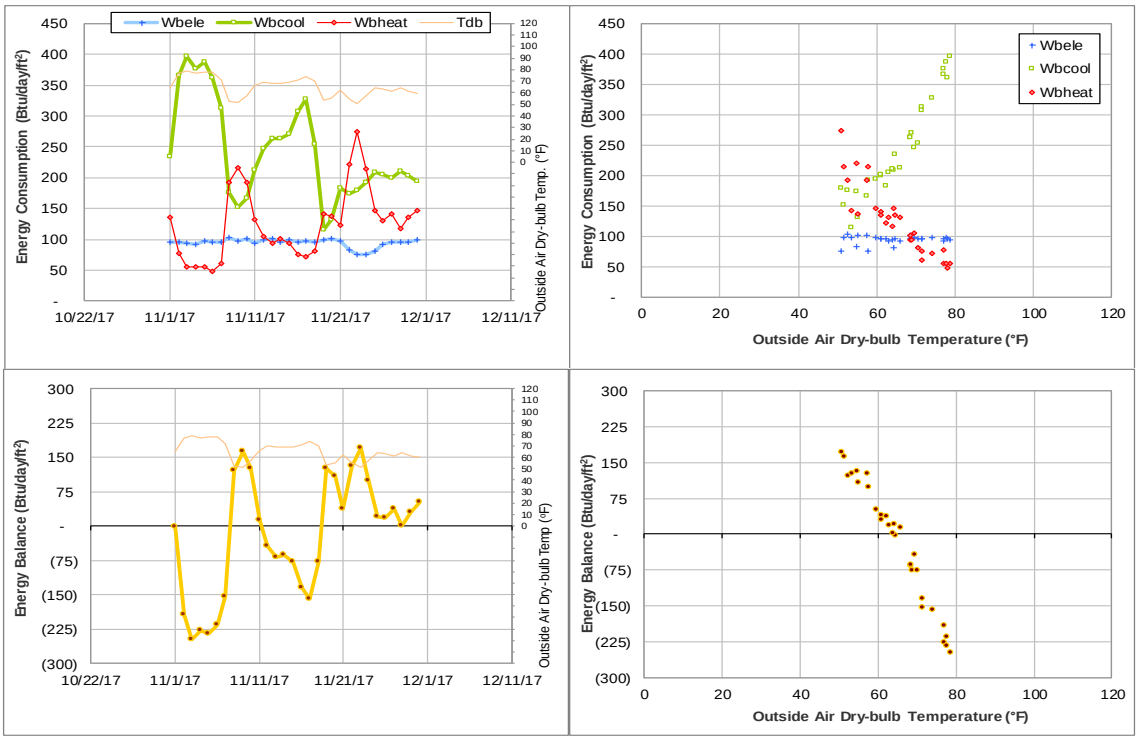


Figure IV-52 Schumacher Residence Hall TAMU BLDG # 430 Energy Balance Plot during November 2017

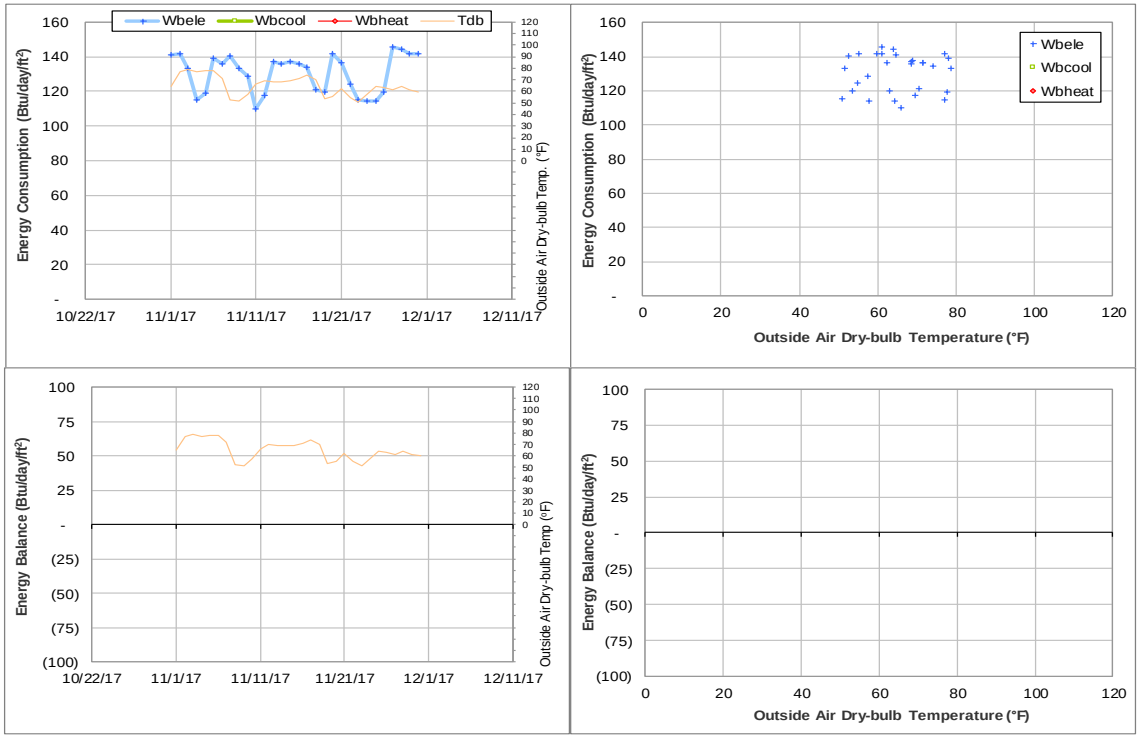


Figure IV-53 Architecture Building C TAMU BLDG # 432 Energy Balance Plot during November 2017

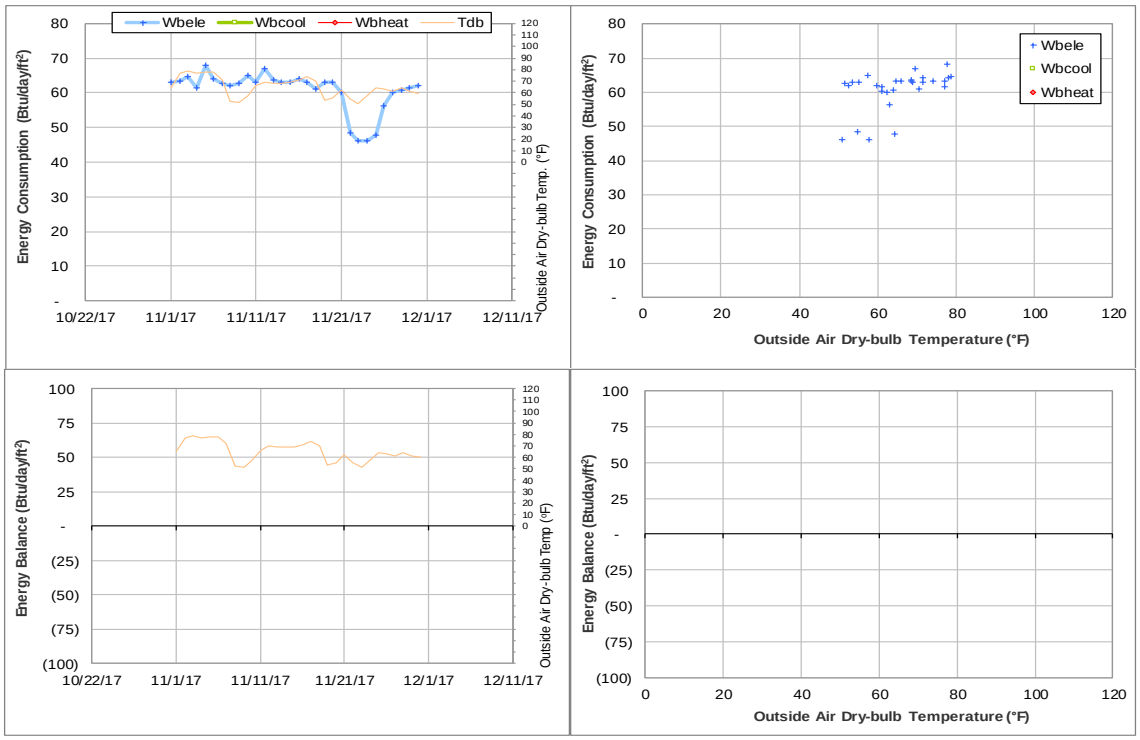


Figure IV-54 Mosher Commons Krueger Dunn Aston TAMU BLDG # 433-440-441-442-447 Energy Balance Plot during November 2017

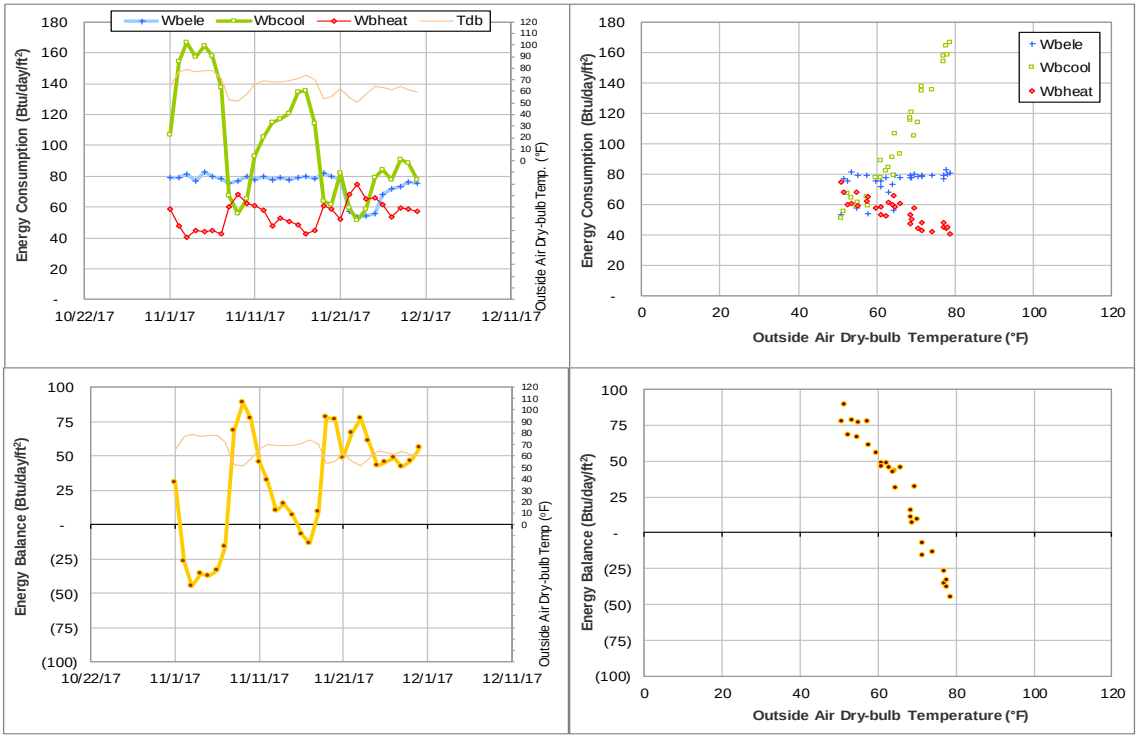


Figure IV-55 Mosher Residence Hall TAMU BLDG # 433 Energy Balance Plot during November 2017

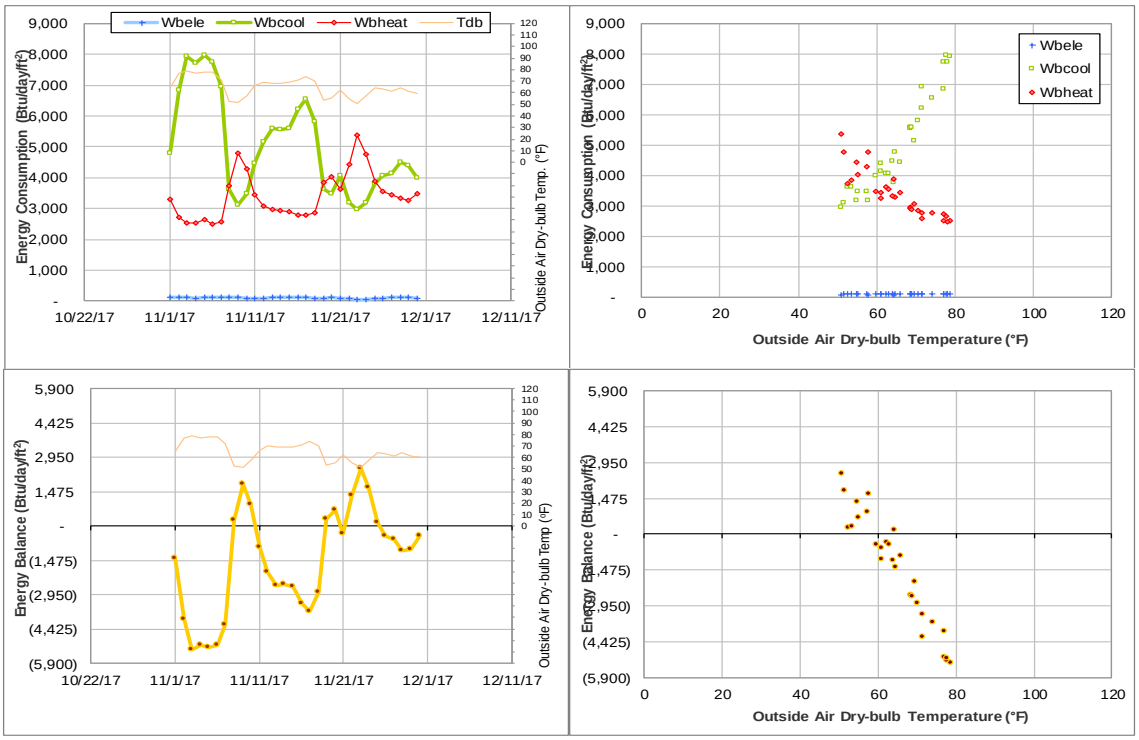


Figure IV-56 Commons and Krueger TAMU BLDG # 440-441 Energy Balance Plot during November 2017

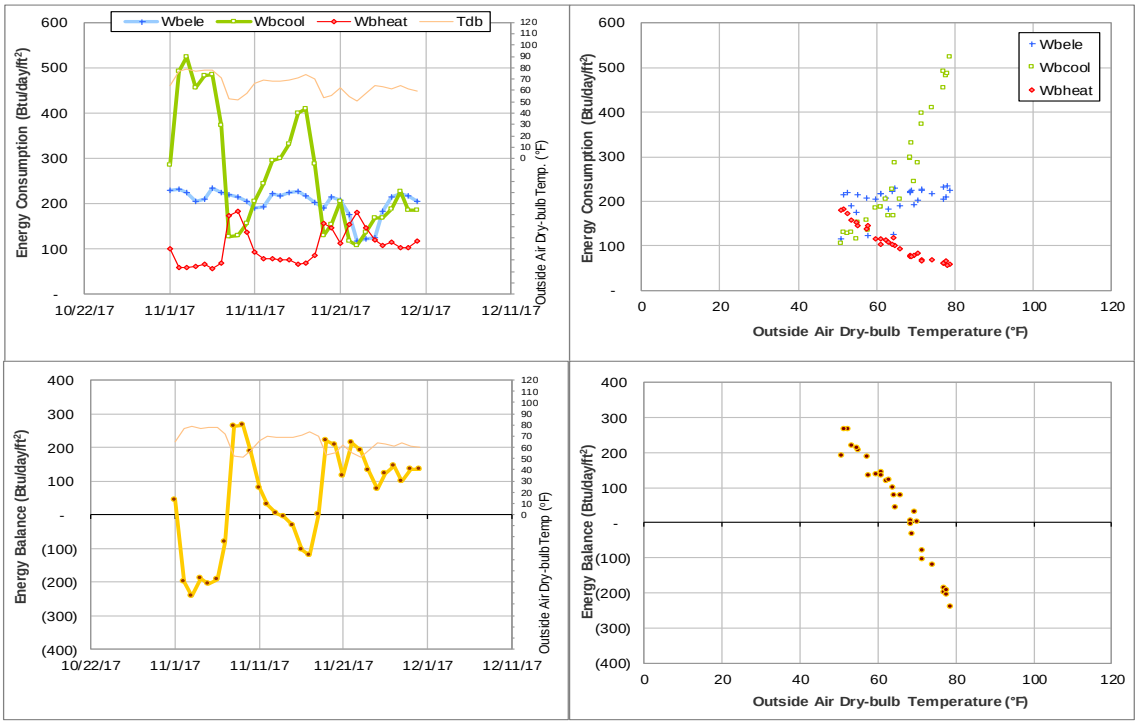


Figure IV-57 Commons Hall TAMU BLDG # 440 Energy Balance Plot during November 2017

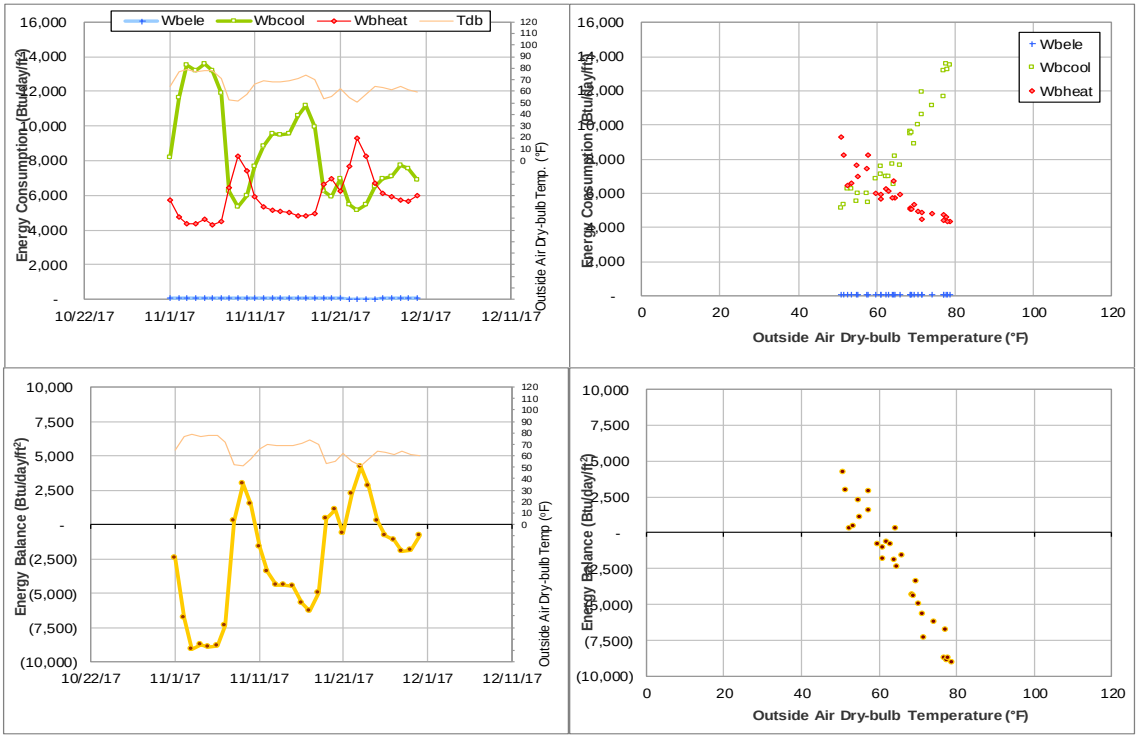


Figure IV-58 Krueger Residence Hall TAMU BLDG # 441 Energy Balance Plot during November 2017

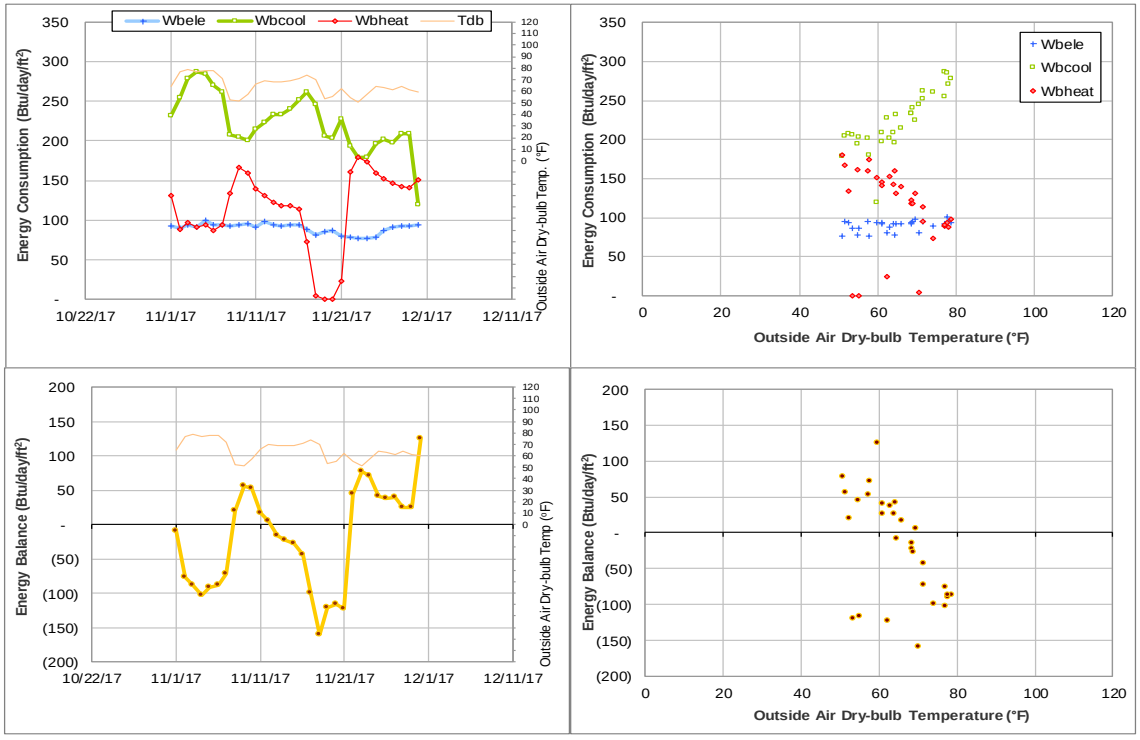


Figure IV-59 Dunn Residence Hall TAMU BLDG # 442 Energy Balance Plot during November 2017

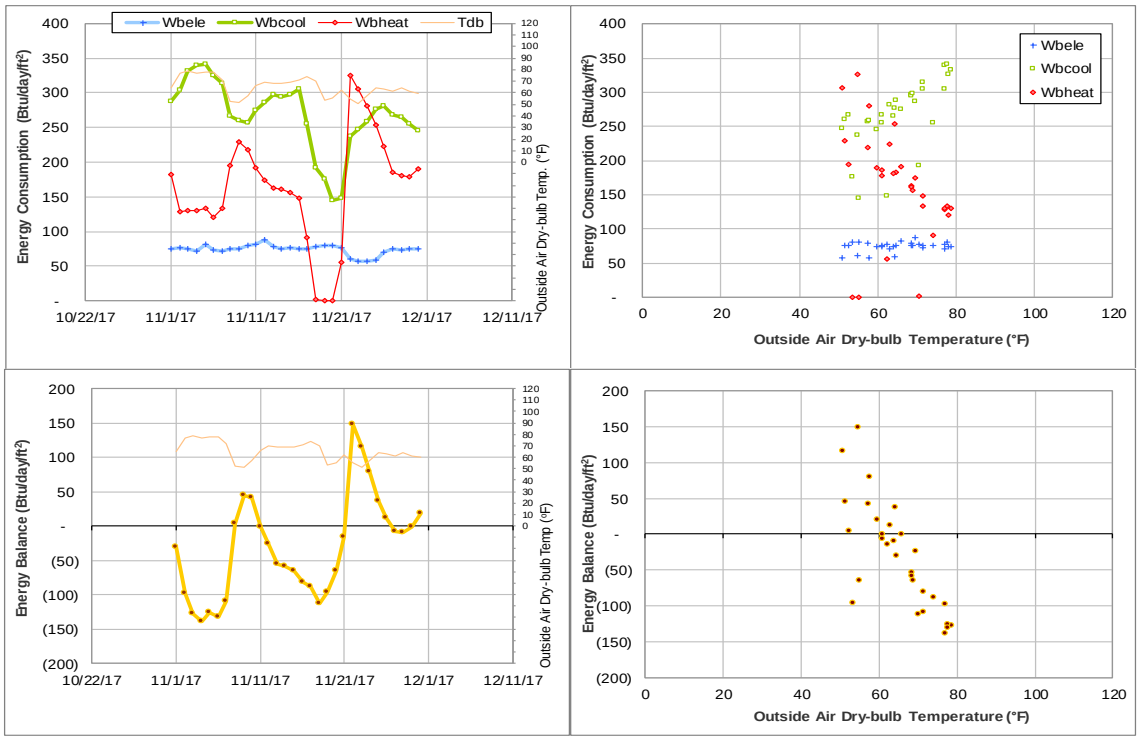


Figure IV-60 Aston Residence Hall TAMU BLDG # 447 Energy Balance Plot during November 2017

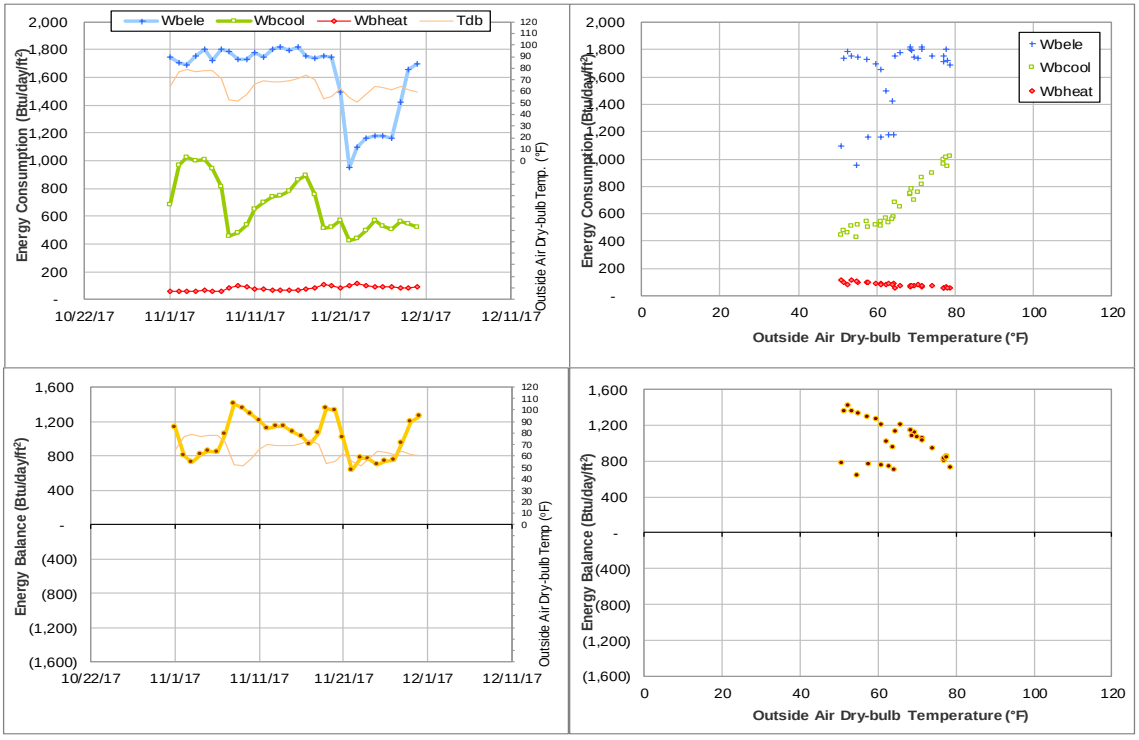


Figure IV-61 Luedecke Building (Cyclotron) TAMU BLDG # 434 Energy Balance Plot during November 2017

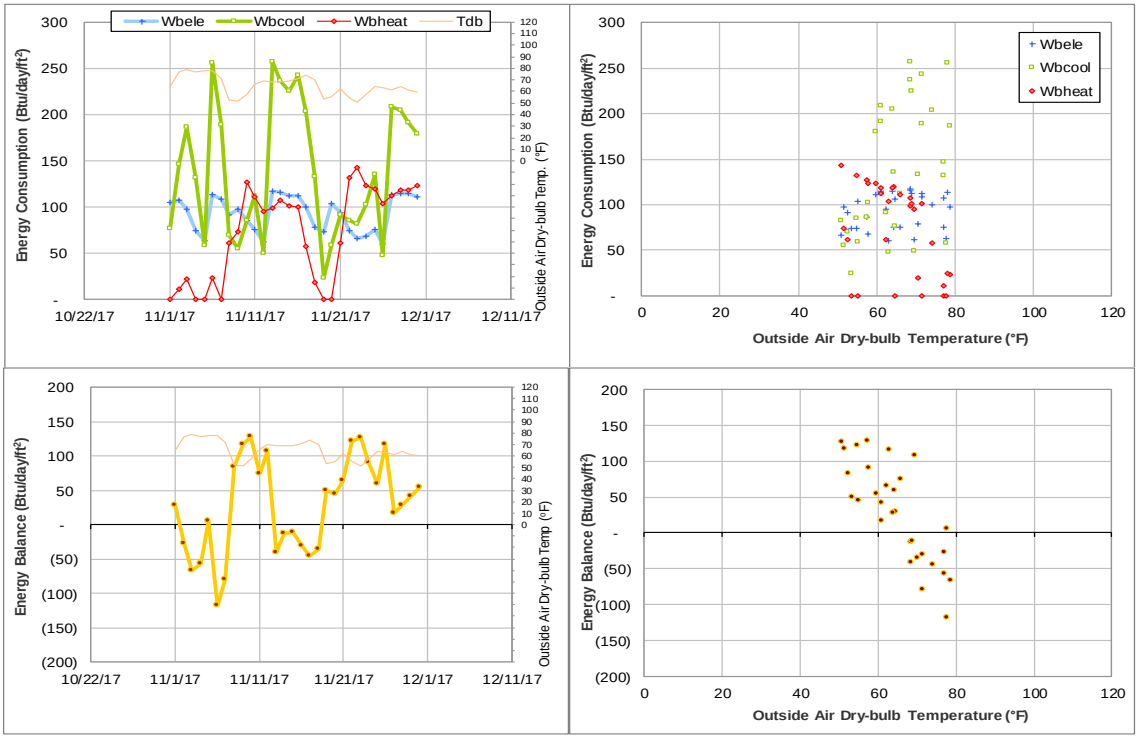


Figure IV-62 Harrington Education Center Office Tower TAMU BLDG # 435 Energy Balance Plot during November 2017

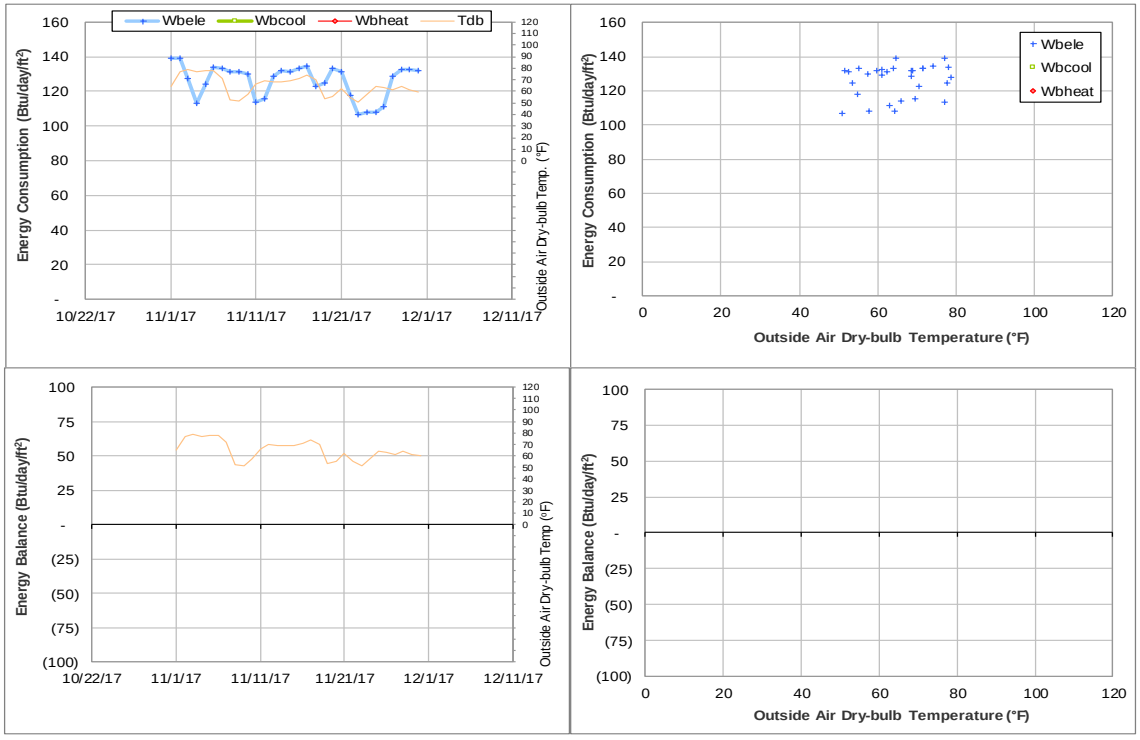


Figure IV-63 Reed-McDonald and Engineering Innovation Center TAMU BLDG # 436-499 Energy Balance Plot during November 2017

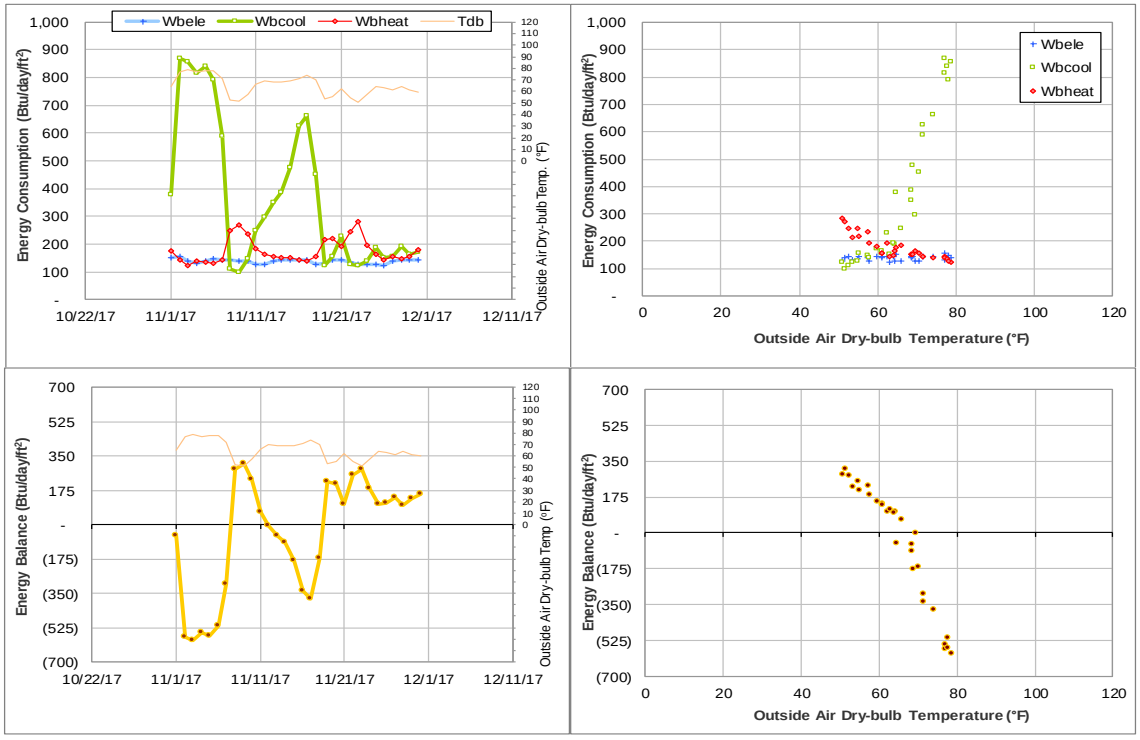


Figure IV-64 Reed-McDonald Building TAMU BLDG # 436 Energy Balance Plot during November 2017

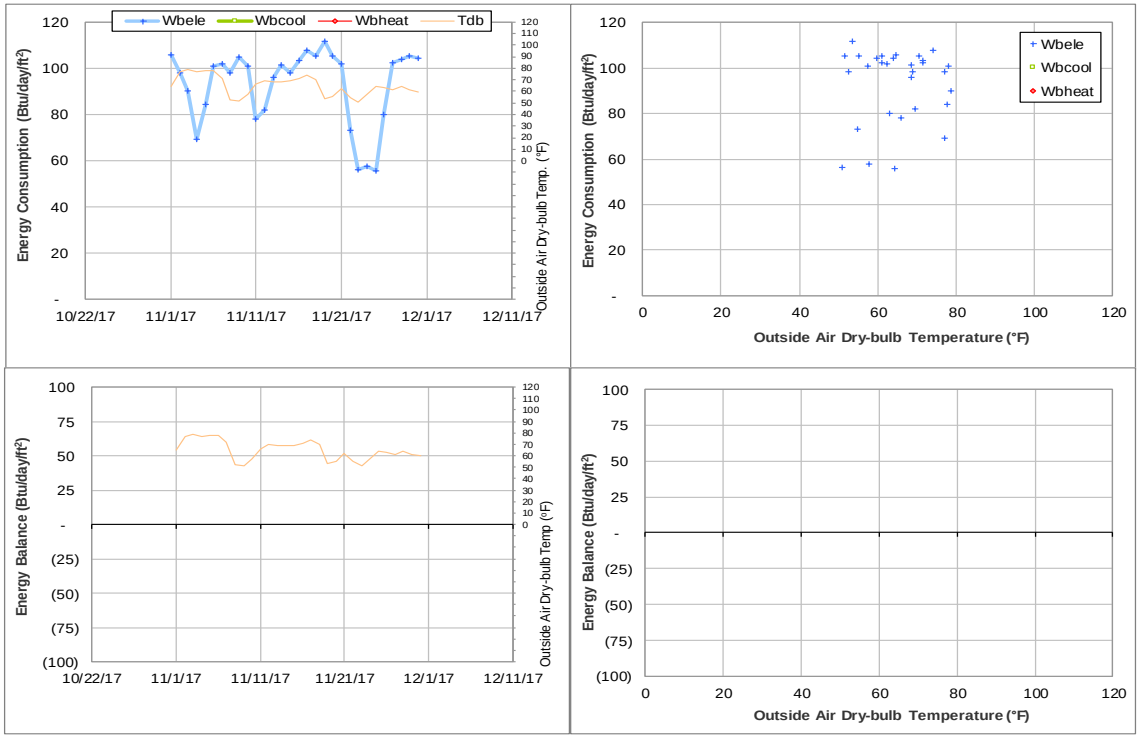


Figure IV-65 Engineering Innovation Center TAMU BLDG # 499 Energy Balance Plot during November 2017

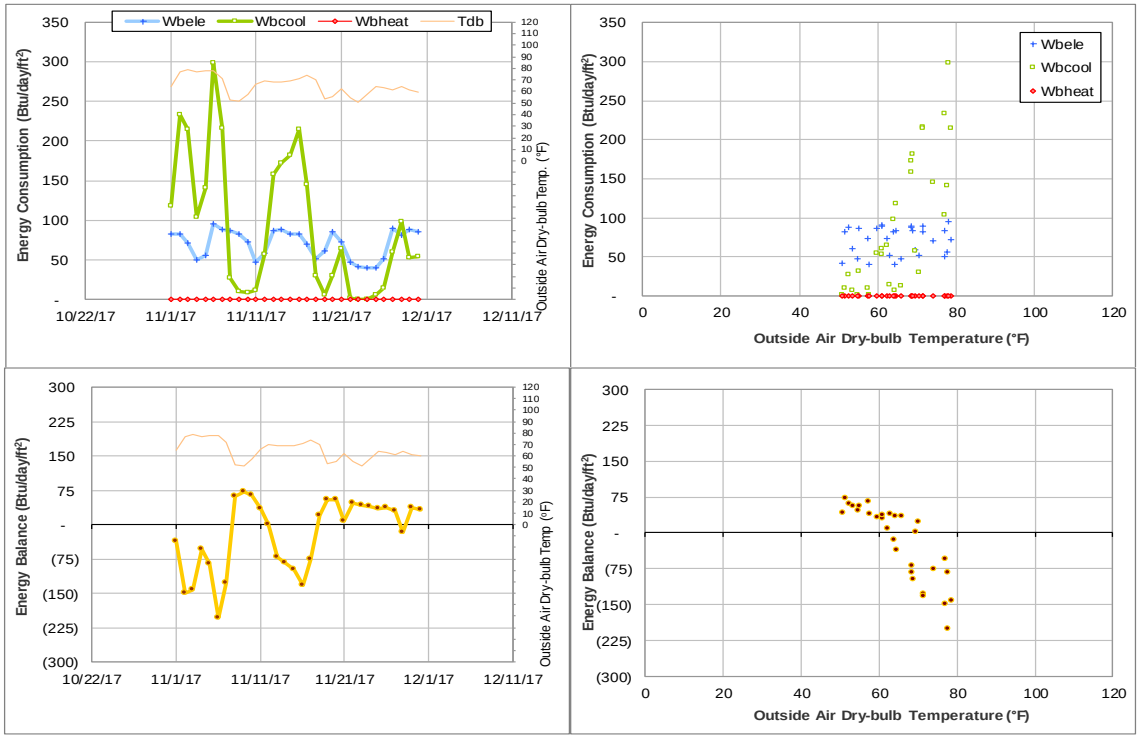


Figure IV-66 Harrington Education Center Classroom Building TAMU BLDG # 438 Energy Balance Plot during November 2017

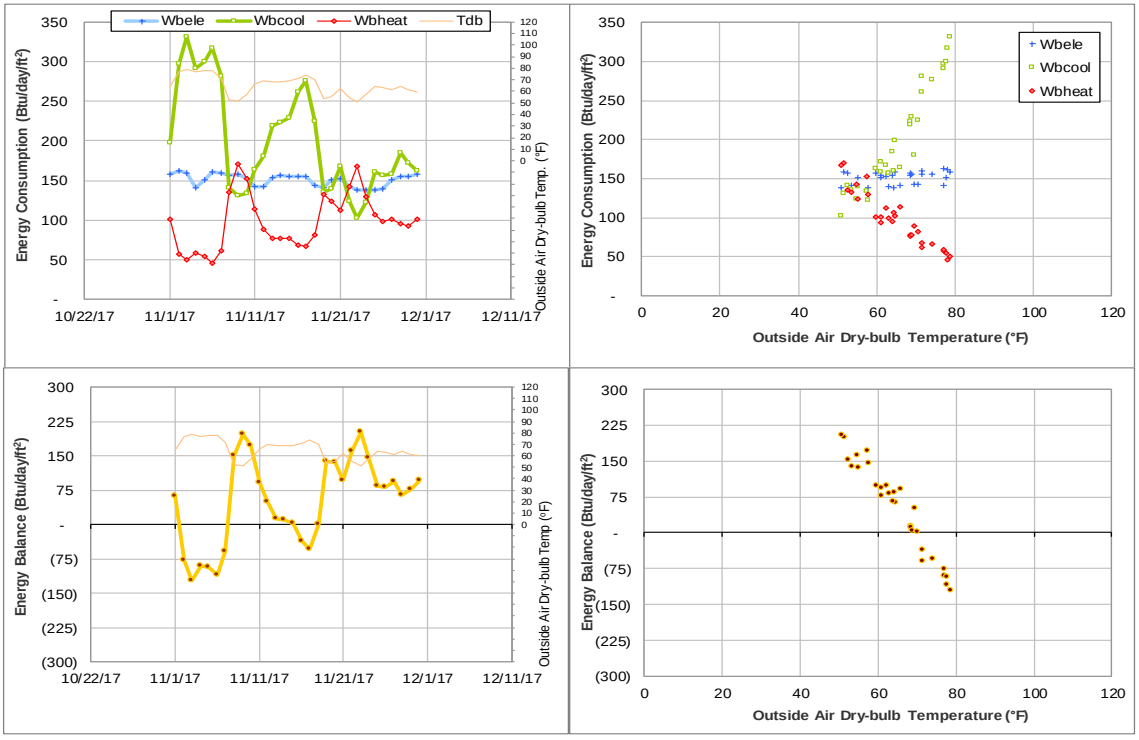


Figure IV-67 Oceanography & Meteorology Building TAMU BLDG # 443 Energy Balance Plot during November 2017

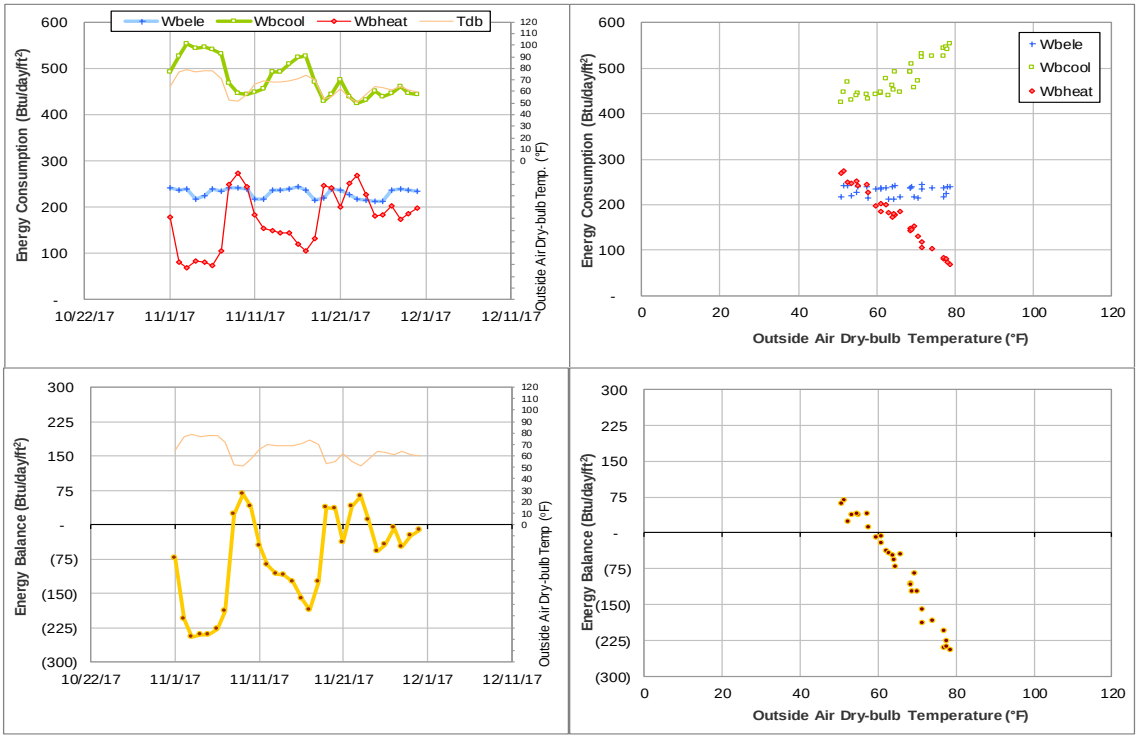


Figure IV-68 Peterson Building TAMU BLDG # 444 Energy Balance Plot during November 2017

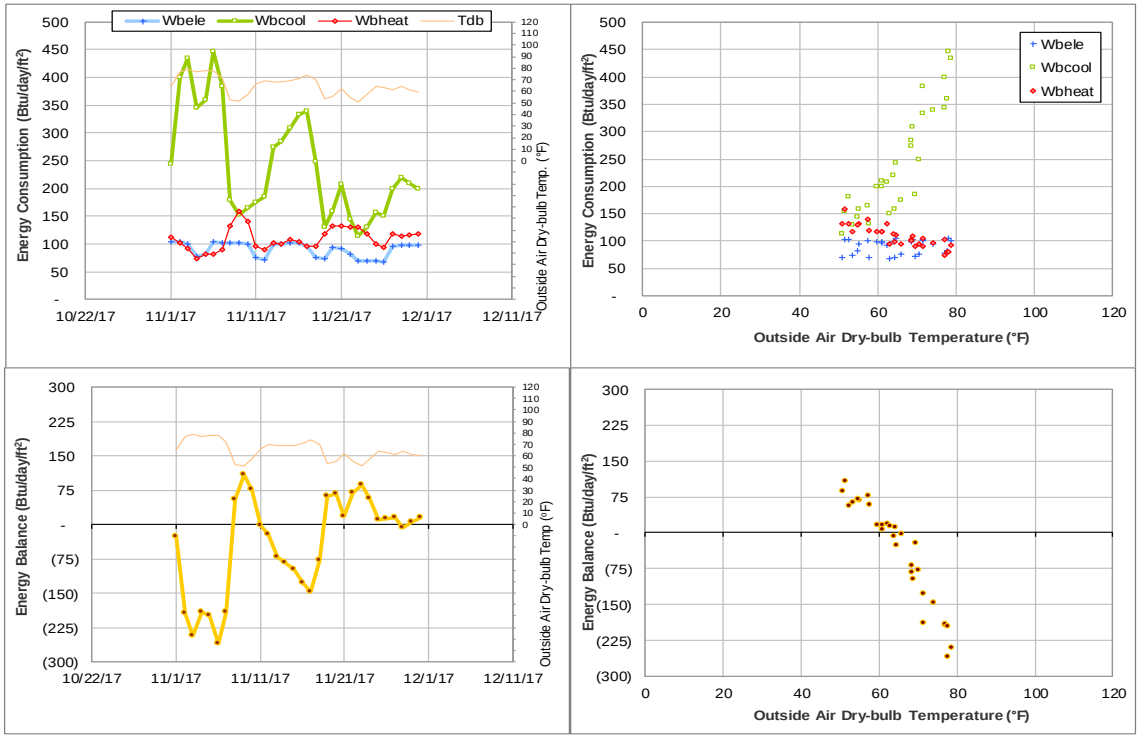


Figure IV-69 Teague Research Center and DPC Annex TAMU BLDG # 445-517 Energy Balance Plot during November 2017

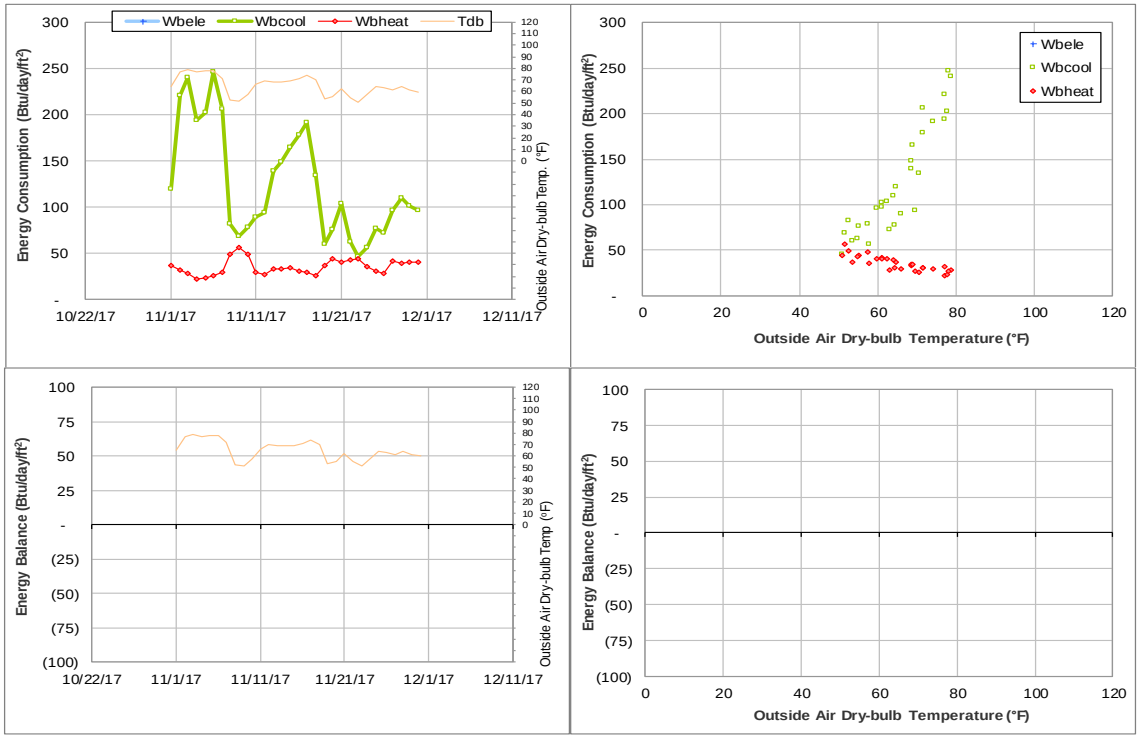


Figure IV-70 Teague Research Center TAMU BLDG # 445 Energy Balance Plot during November 2017

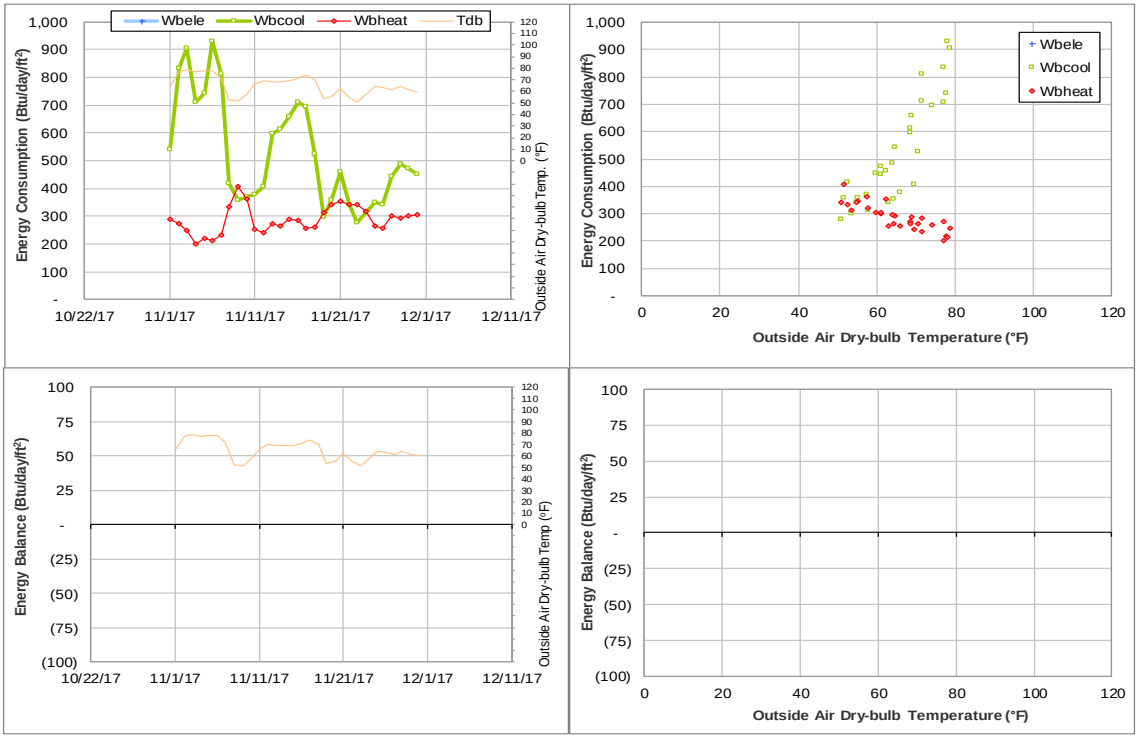


Figure IV-71 DPC Annex TAMU BLDG # 517 Energy Balance Plot during November 2017

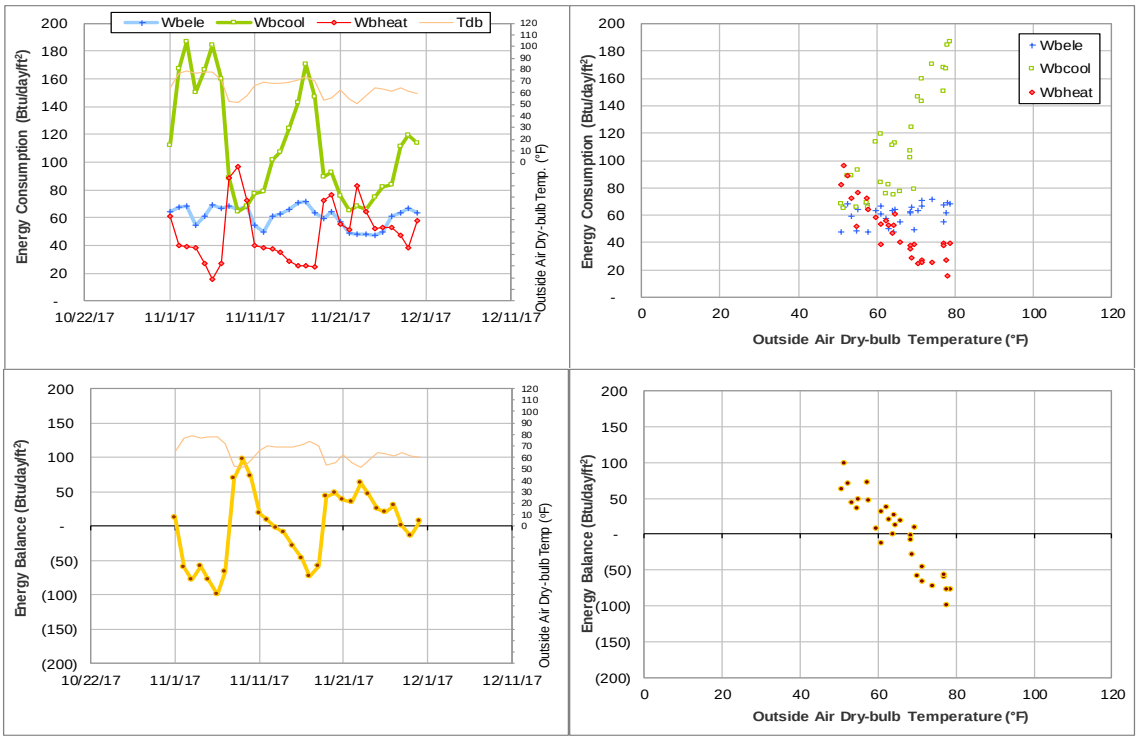


Figure IV-72 Rudder Tower and Theatre Complex TAMU BLDG # 446 Energy Balance Plot during November 2017

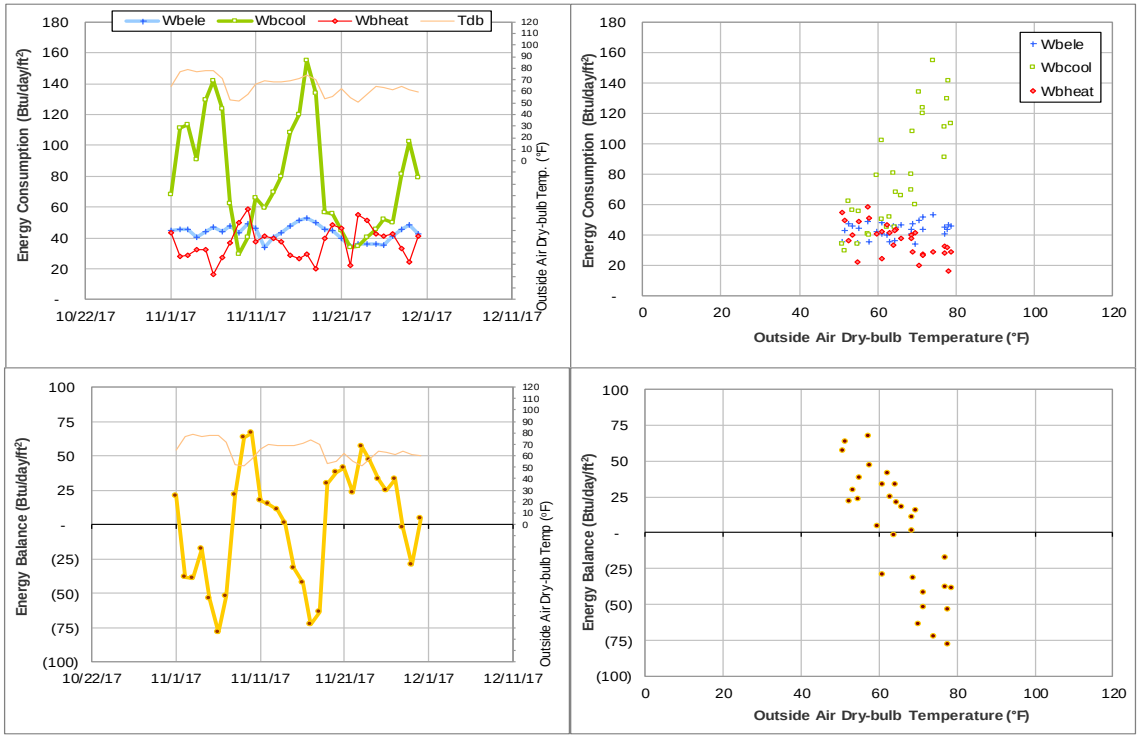


Figure IV-73 Rudder Theatre Complex TAMU BLDG # 446 Energy Balance Plot during November 2017

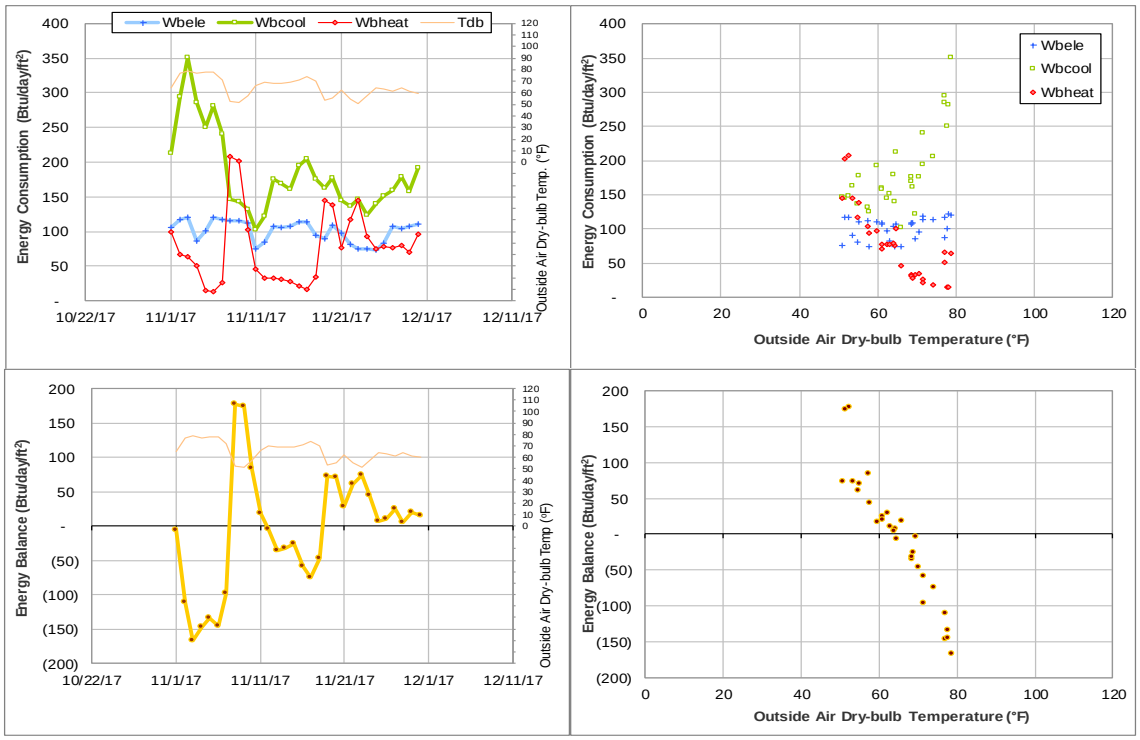


Figure IV-74 Rudder Tower TAMU BLDG # 446 Energy Balance Plot during November 2017

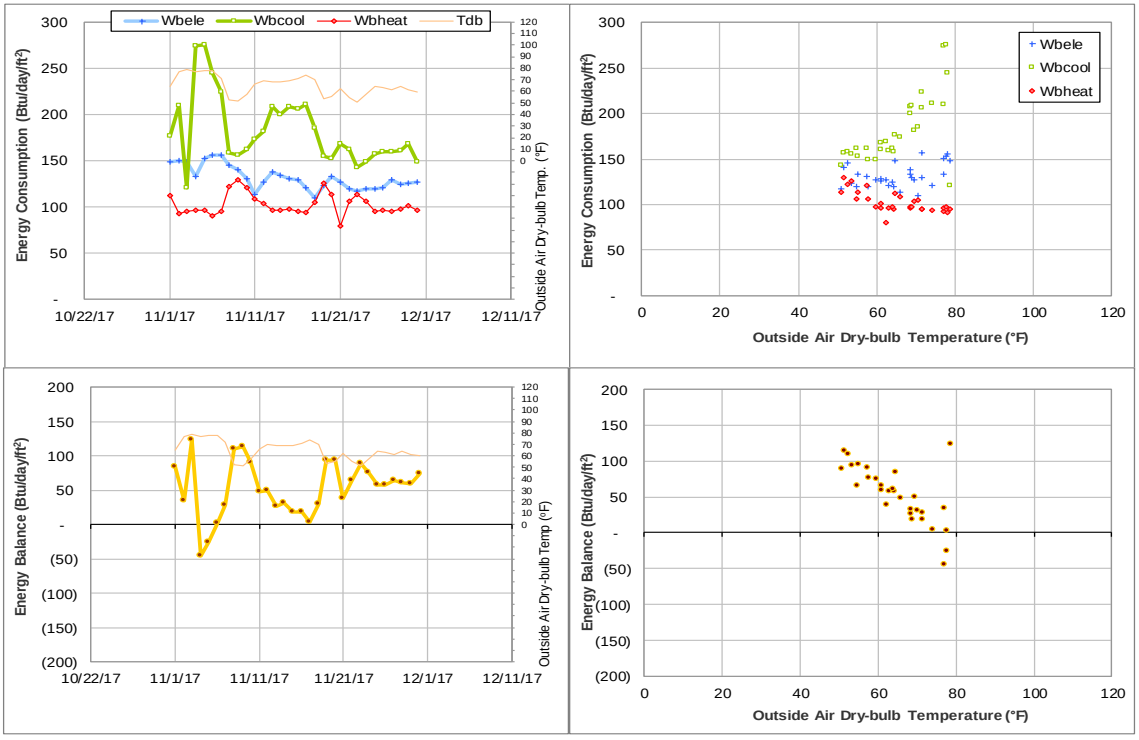


Figure IV-75 Adams Band Hall TAMU BLDG # 448 Energy Balance Plot during November 2017

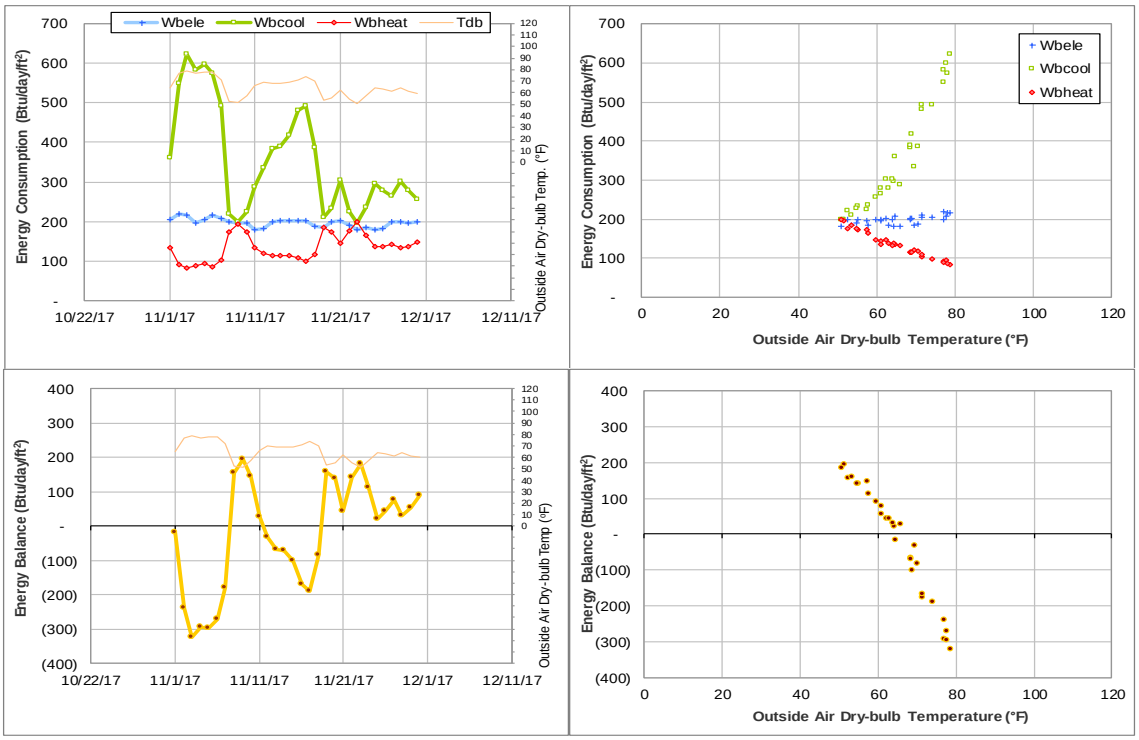


Figure IV-76 Biological Sciences Building - West TAMU BLDG # 449 Energy Balance Plot during November 2017

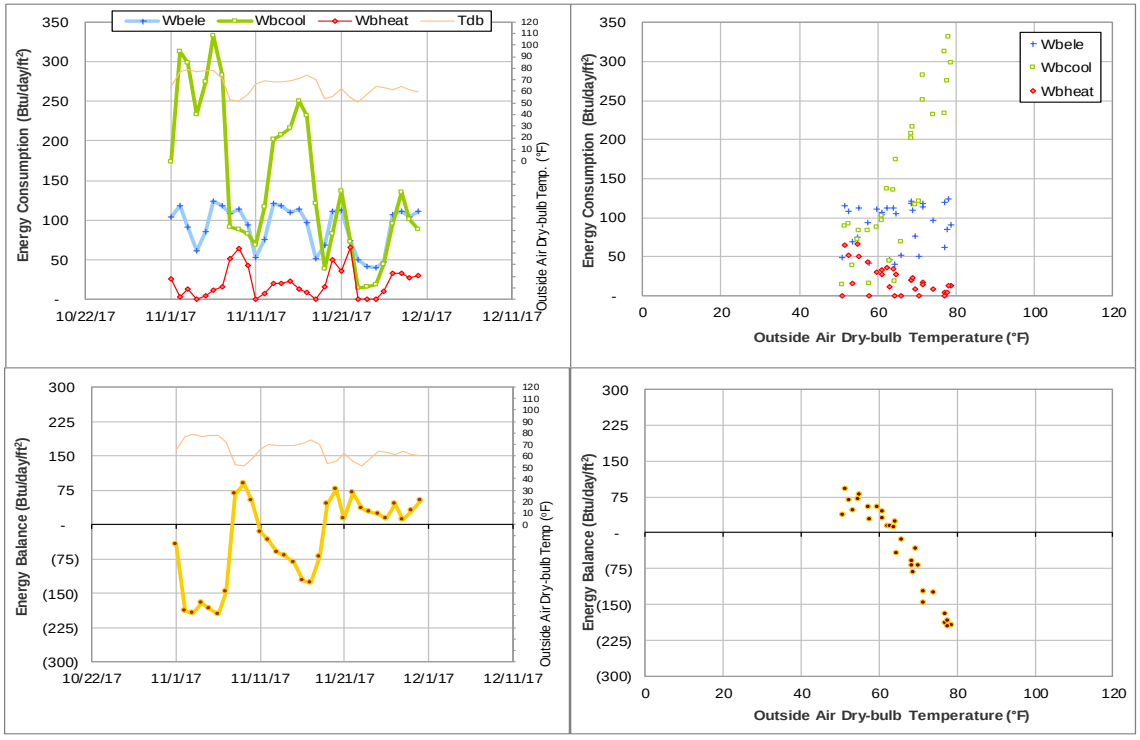


Figure IV-77 Duncan Dining Hall TAMU BLDG # 450 Energy Balance Plot during November 2017

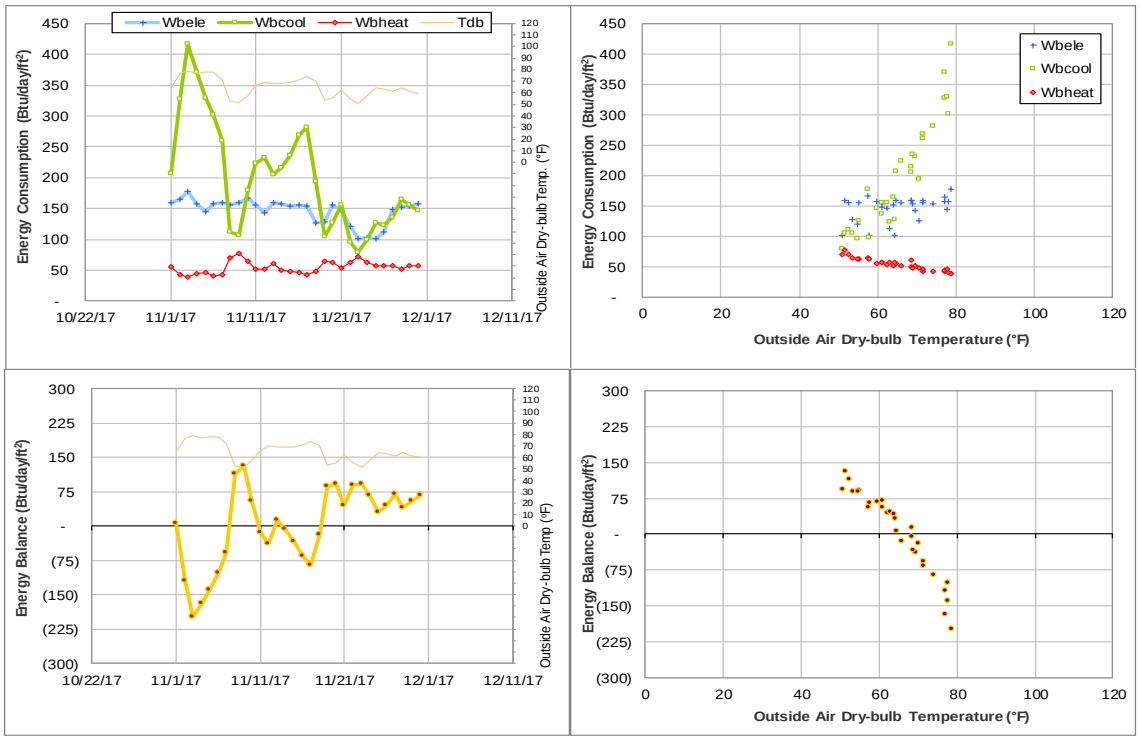


Figure IV-78 MSC TAMU BLDG # 454 Energy Balance Plot during November 2017

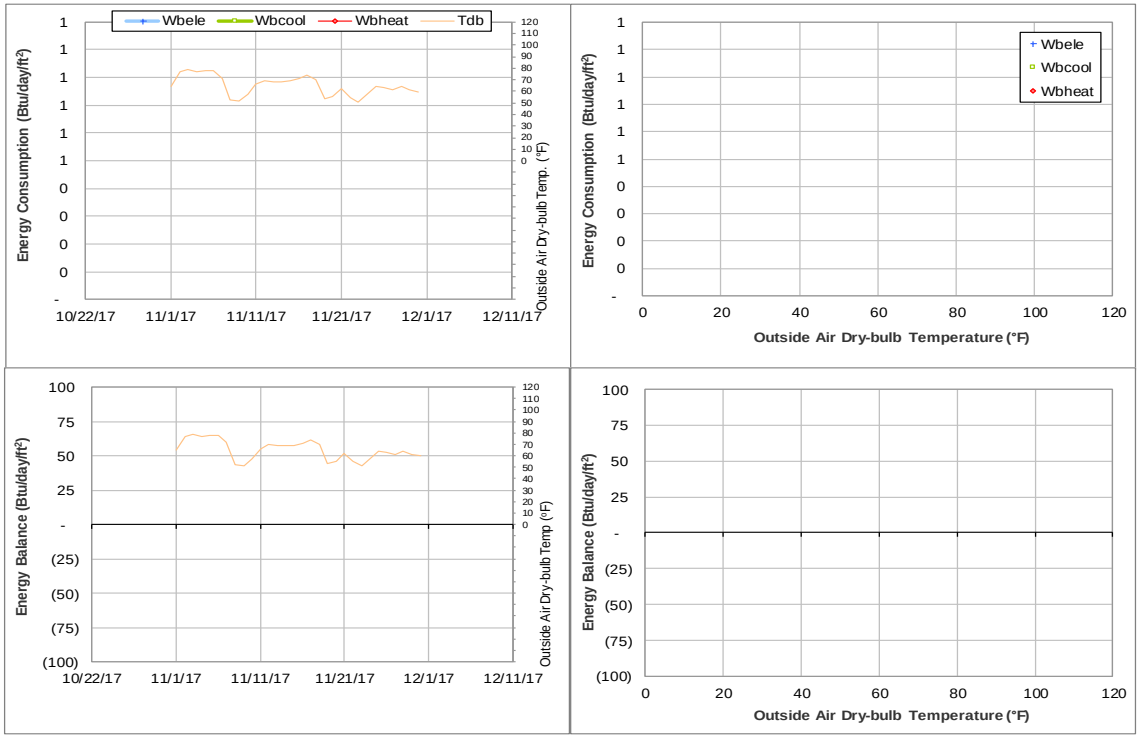


Figure IV-79 Military Sciences Building TAMU BLDG # 456 Energy Balance Plot during November 2017

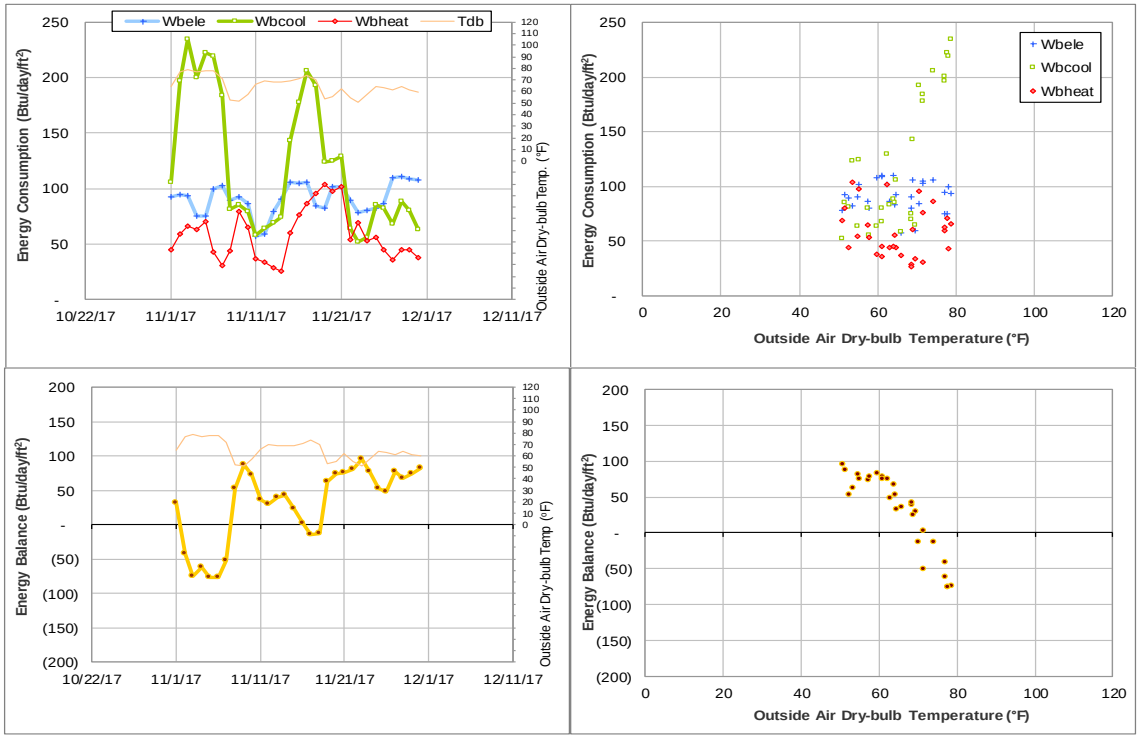


Figure IV-80 TAES Annex Building TAMU BLDG # 457 Energy Balance Plot during November 2017

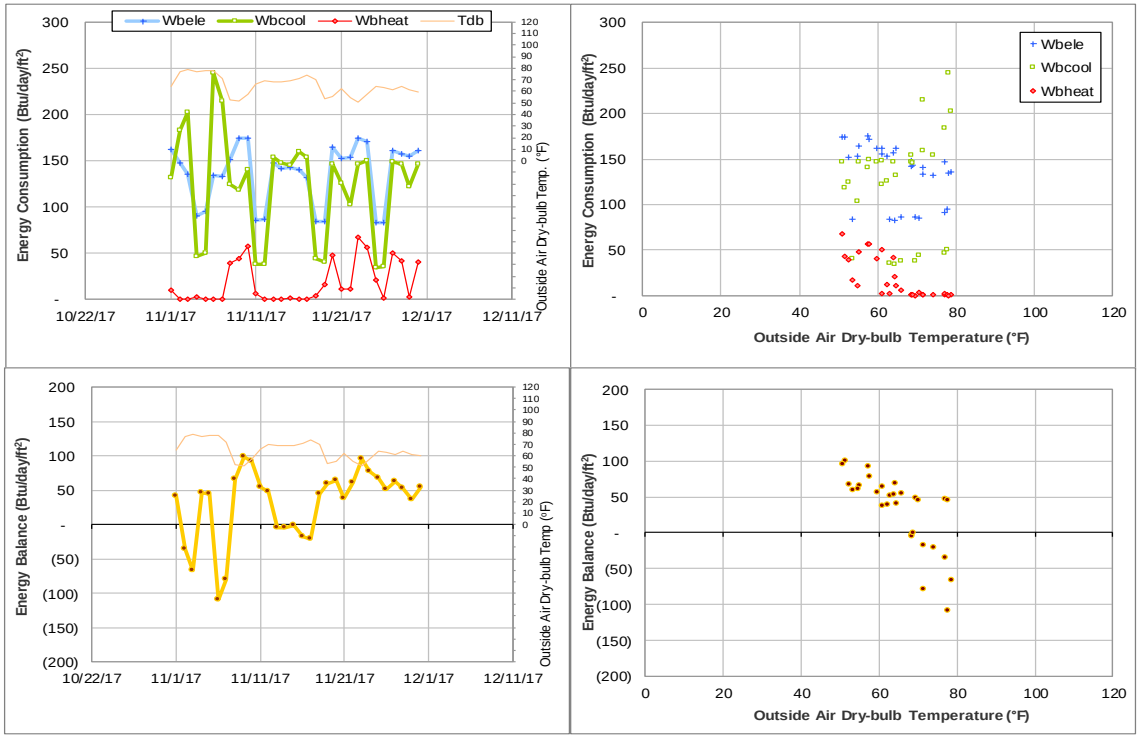


Figure IV-81 Coke Building TAMU BLDG # 461 Energy Balance Plot during November 2017

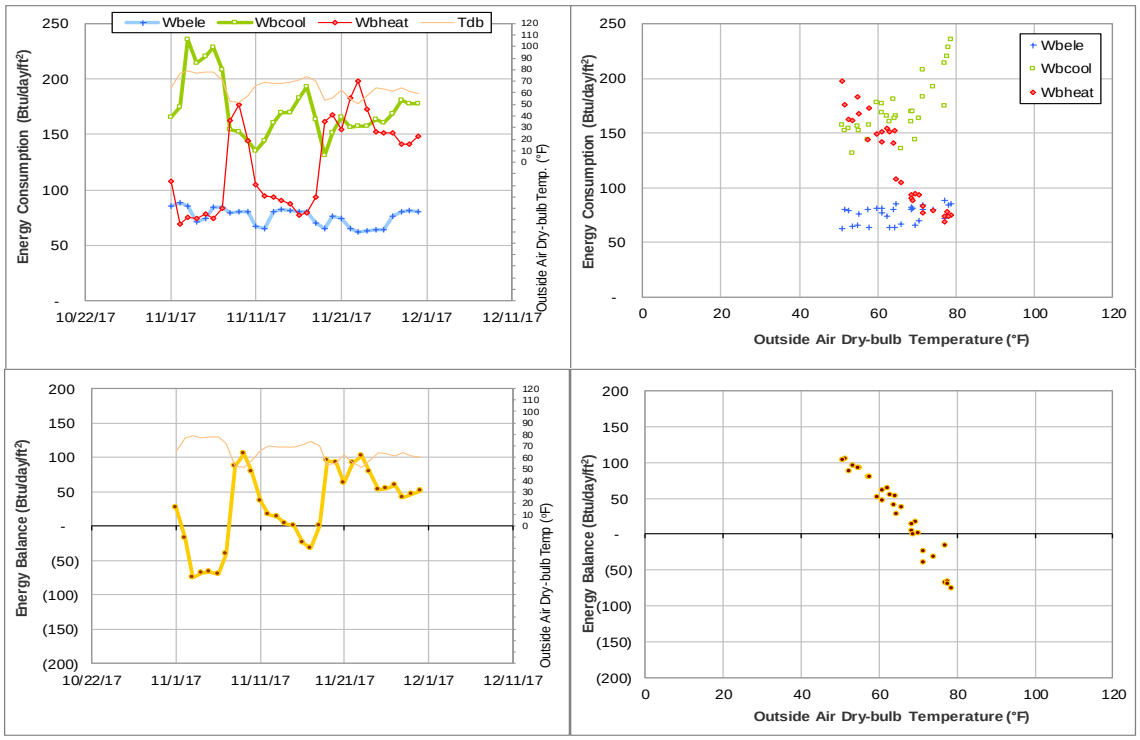


Figure IV-82 Academic Building TAMU BLDG # 462 Energy Balance Plot during November 2017

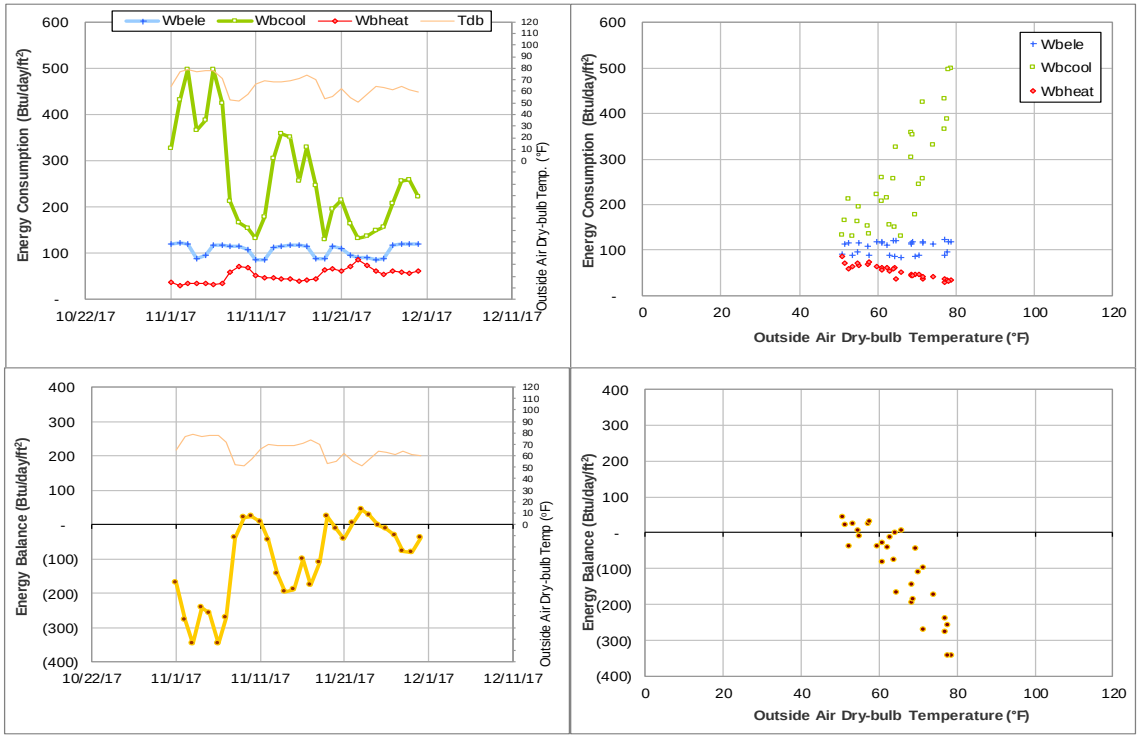


Figure IV-83 Psychology Building TAMU BLDG # 463 Energy Balance Plot during November 2017

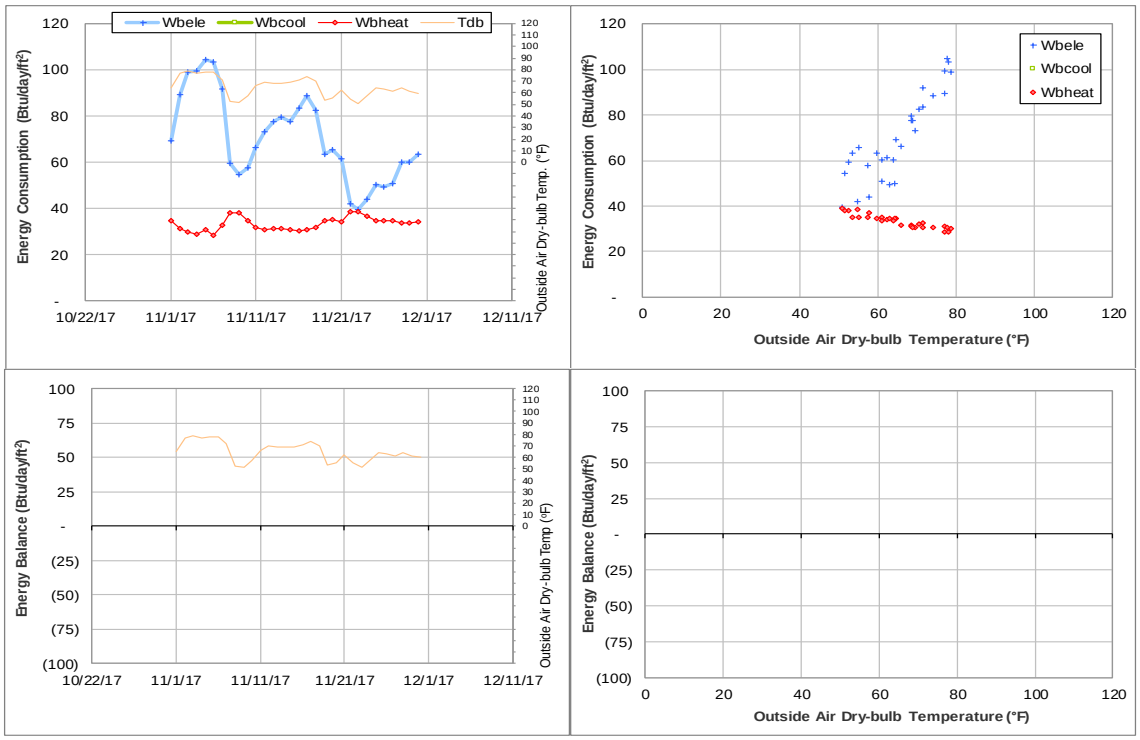


Figure IV-84 State Chemist Building TAMU BLDG # 464 Energy Balance Plot during November 2017

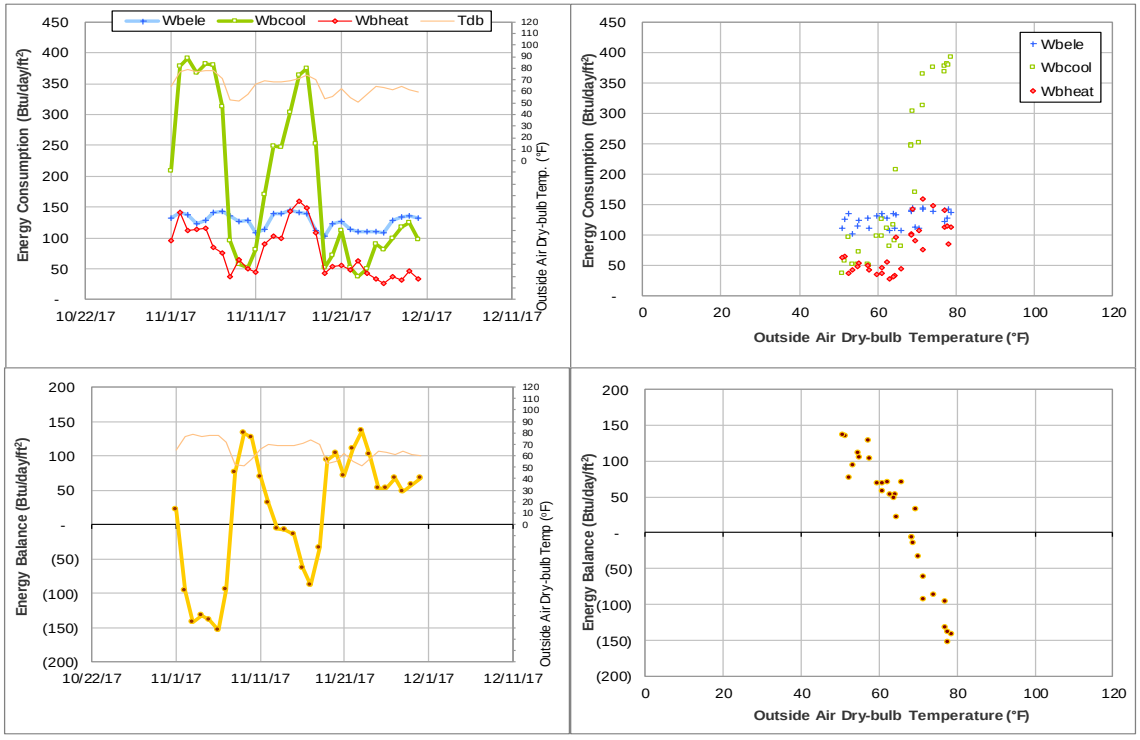


Figure IV-85 Butler Hall TAMU BLDG # 465 Energy Balance Plot during November 2017

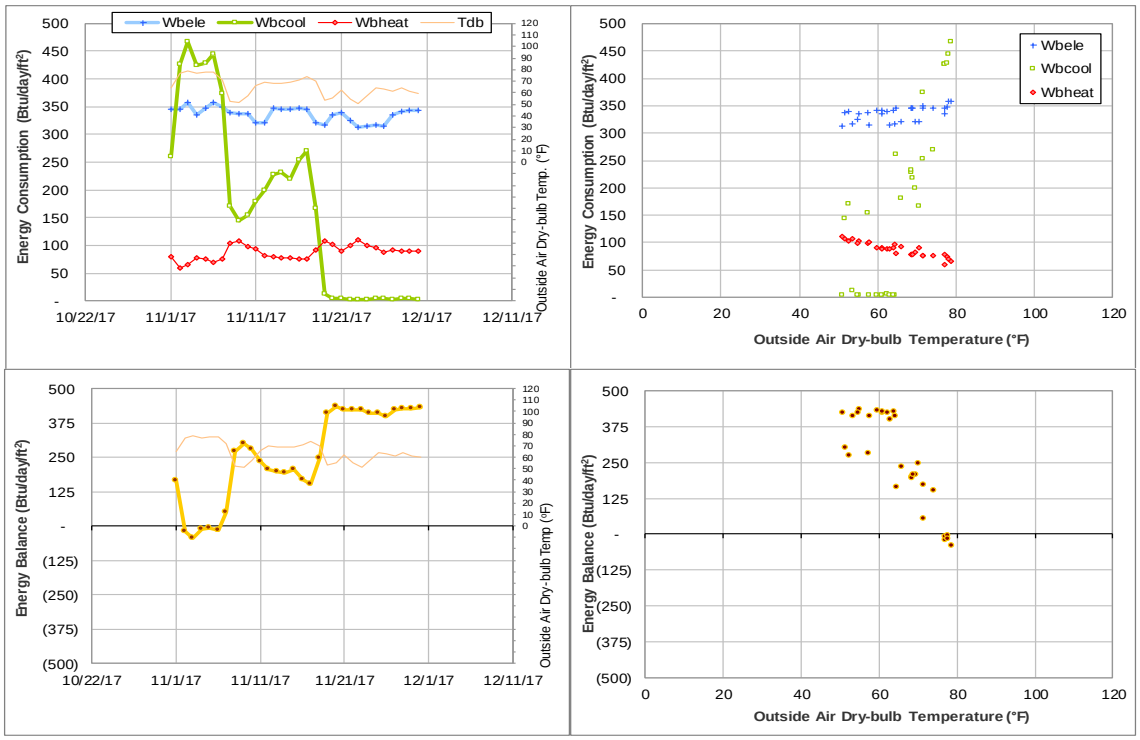


Figure IV-86 Biological Sciences Building - East TAMU BLDG # 467 Energy Balance Plot during November 2017

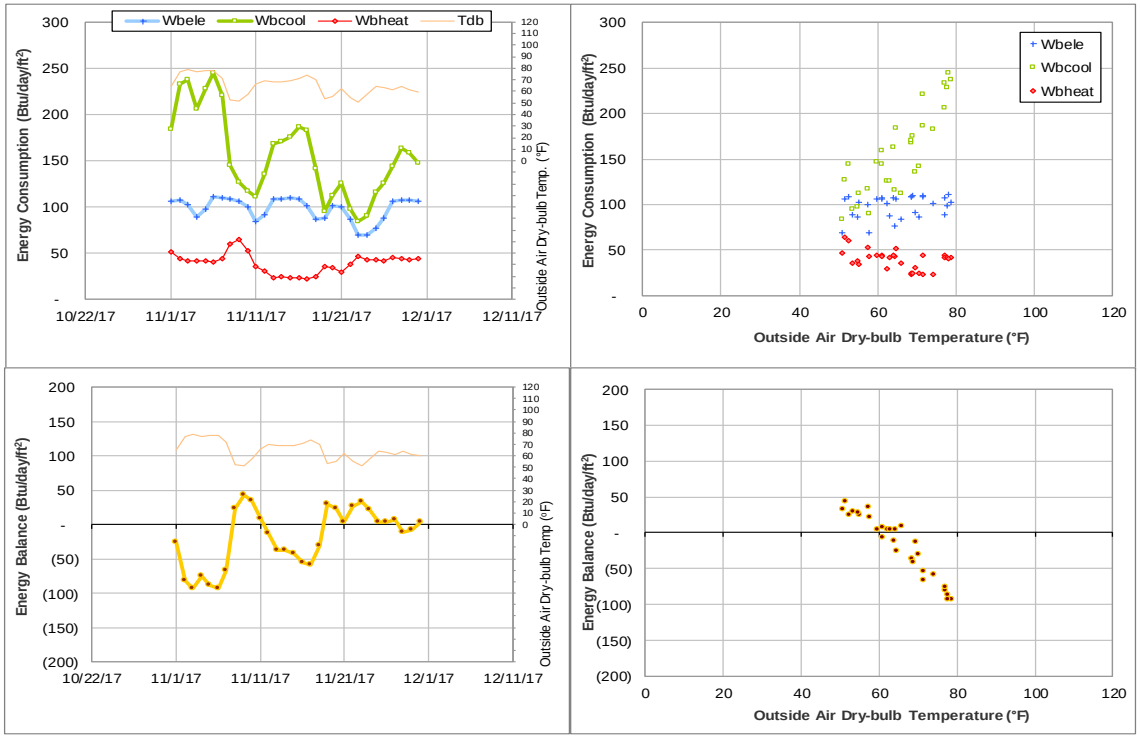


Figure IV-87 Evans Library TAMU BLDG # 468 Energy Balance Plot during November 2017

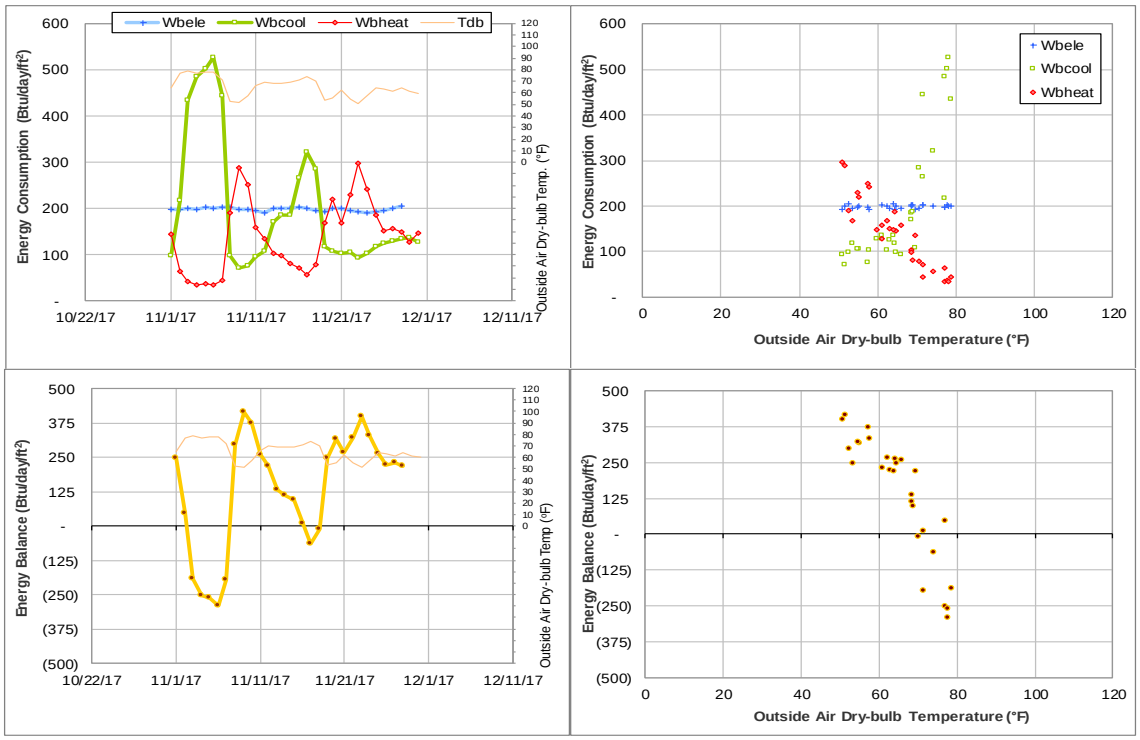


Figure IV-88 Central Campus Parking Garage TAMU BLDG # 469 Energy Balance Plot during November 2017

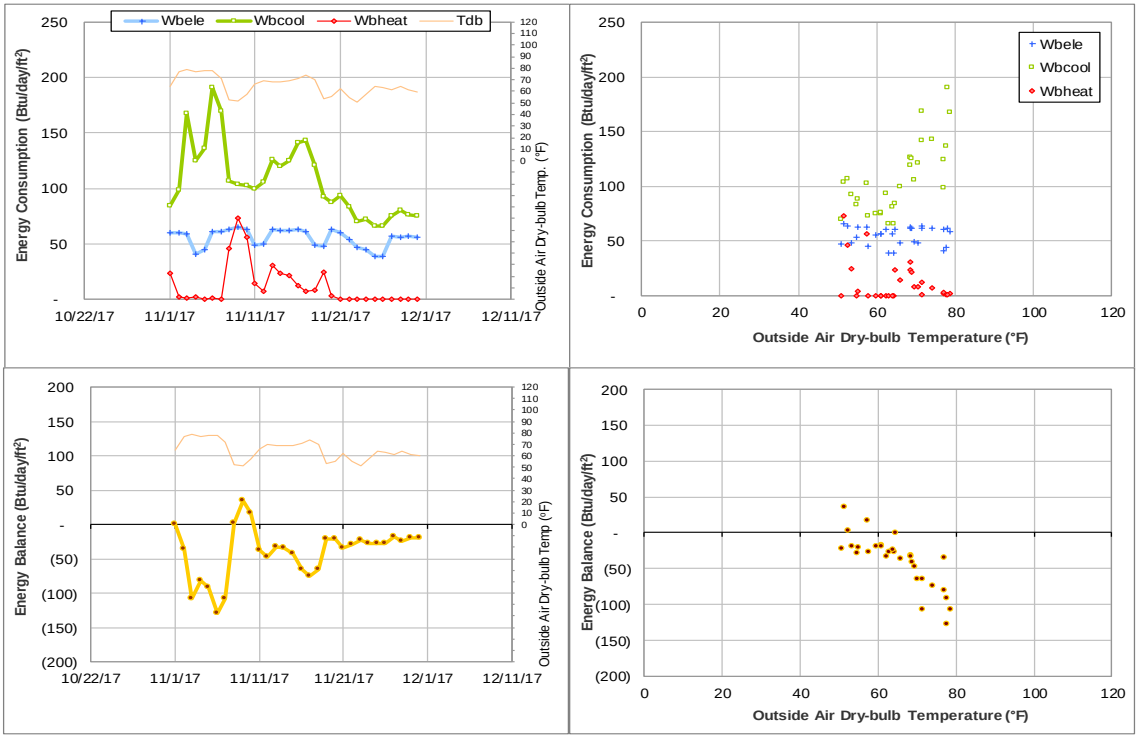


Figure IV-89 Glasscock History Bldg TAMU BLDG # 470 Energy Balance Plot during November 2017

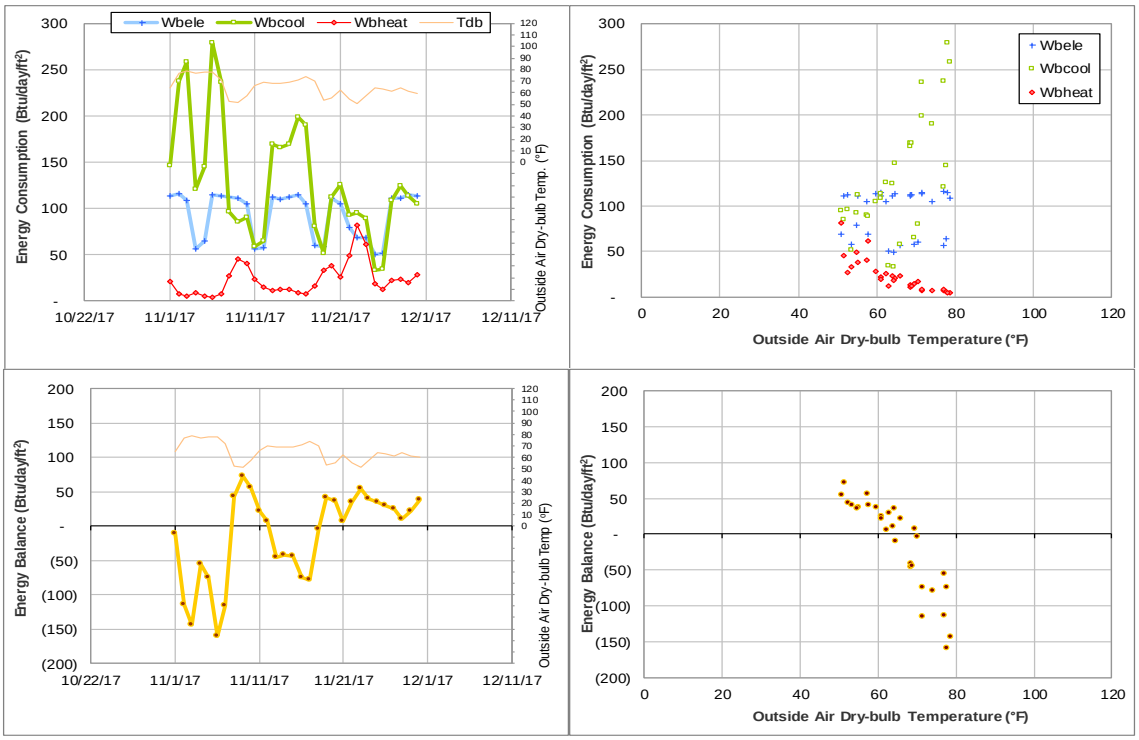


Figure IV-90 Pavilion TAMU BLDG # 471 Energy Balance Plot during November 2017

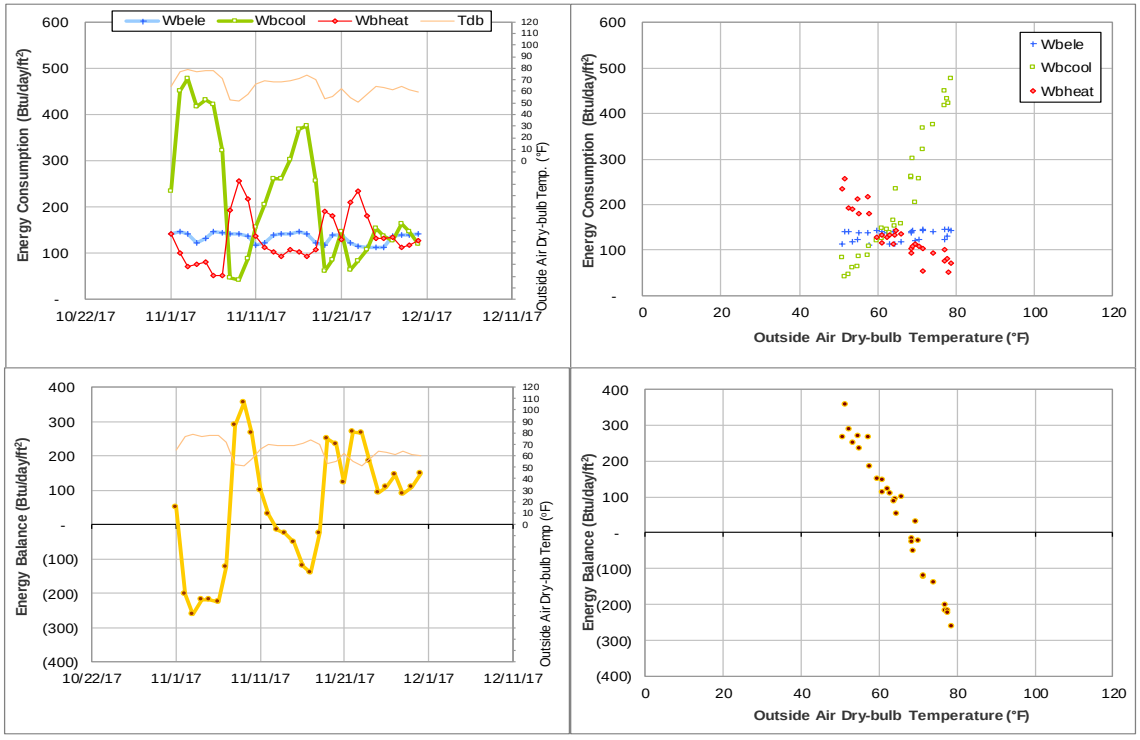


Figure IV-91 Animal Industries TAMU BLDG # 472 Energy Balance Plot during November 2017

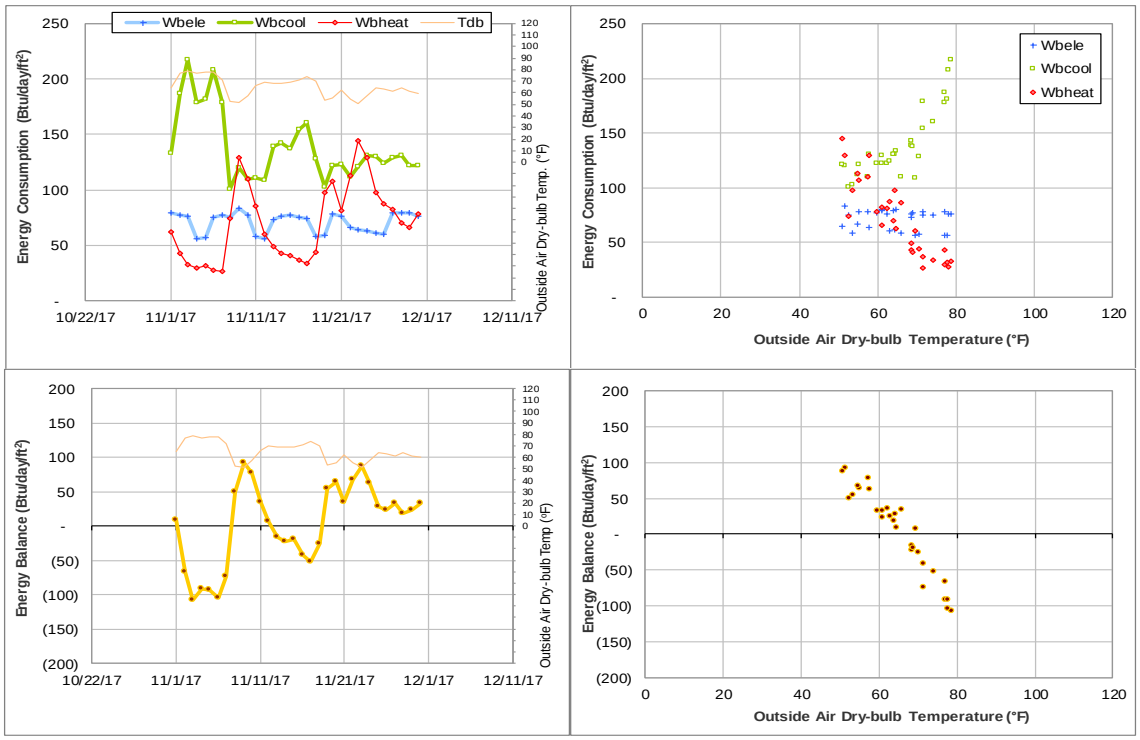


Figure IV-92 Williams Administration Building TAMU BLDG # 473 Energy Balance Plot during November 2017

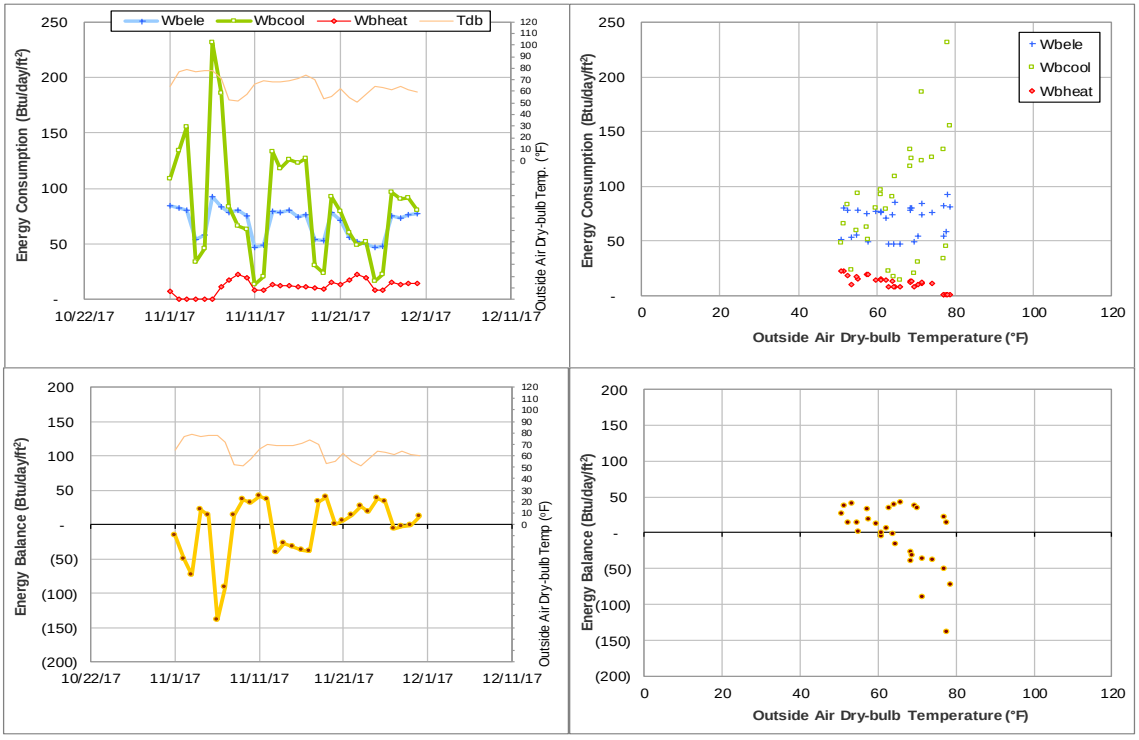


Figure IV-93 YMCA Building TAMU BLDG # 474 Energy Balance Plot during November 2017

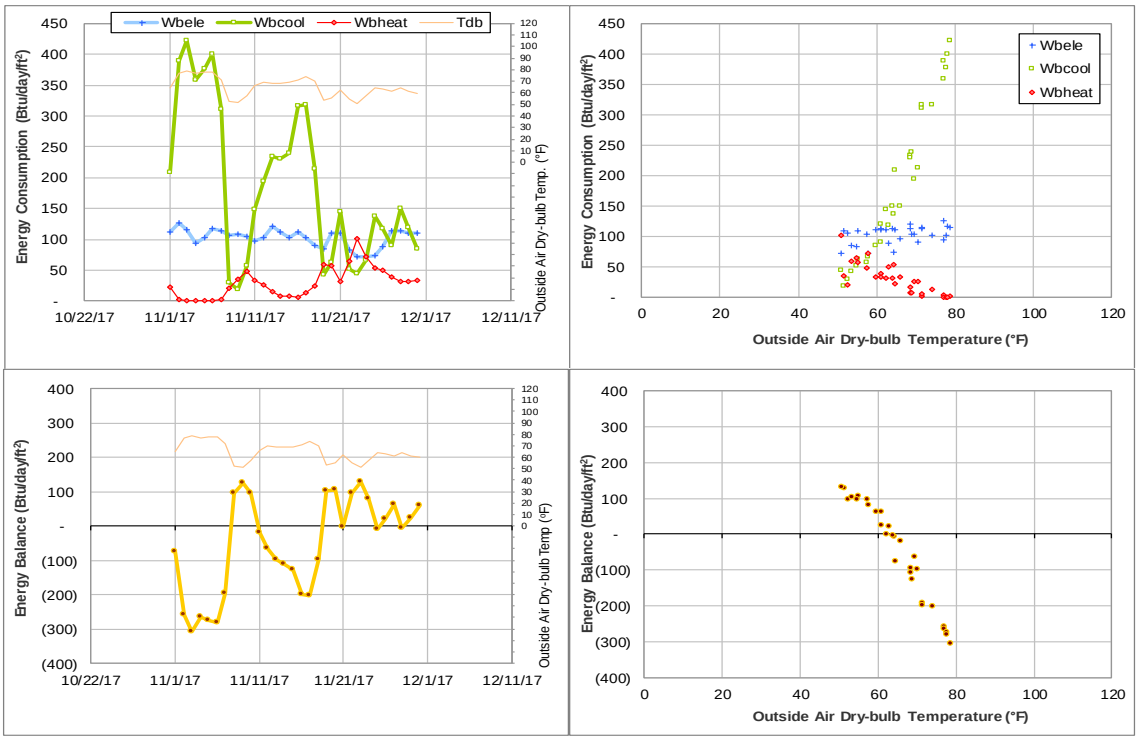


Figure IV-94 Francis Hall TAMU BLDG # 476 Energy Balance Plot during November 2017

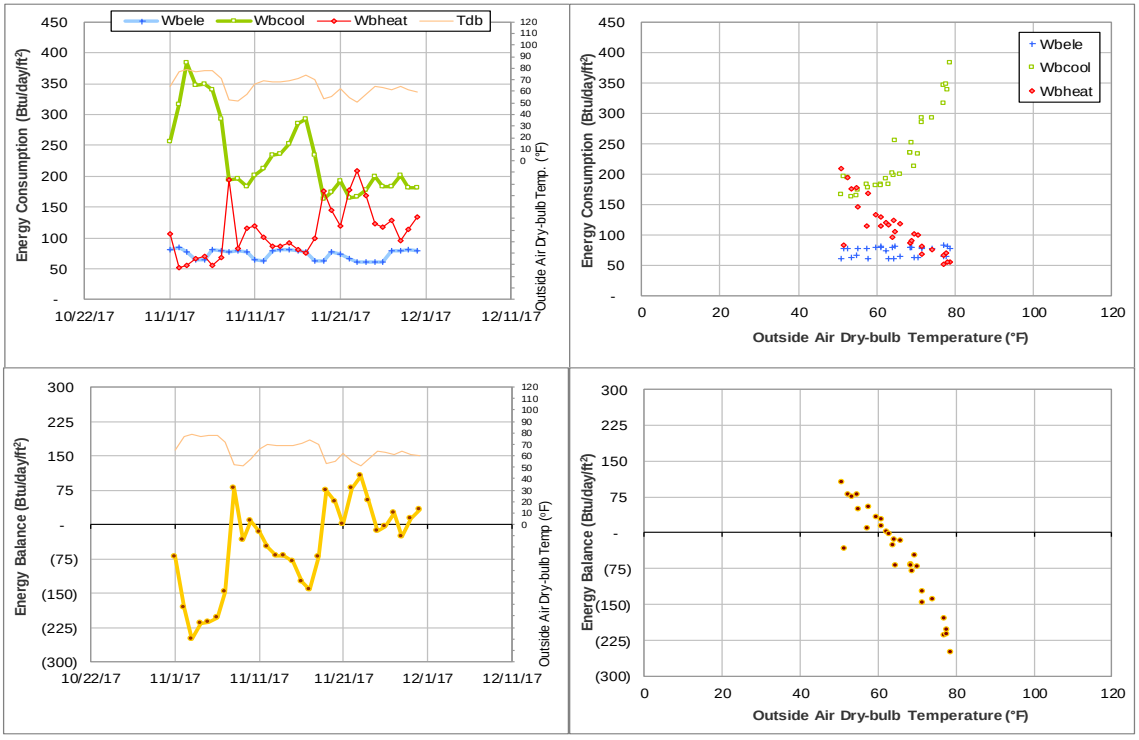


Figure IV-95 Anthropology Building TAMU BLDG # 477 Energy Balance Plot during November 2017

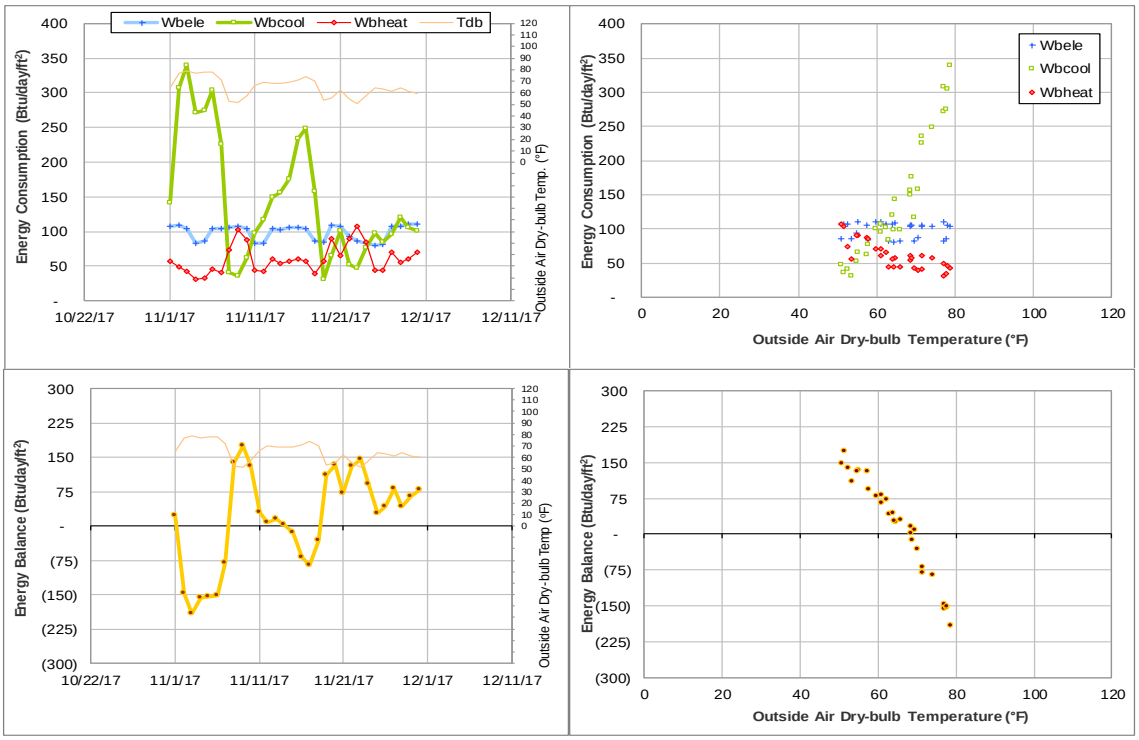


Figure IV-96 Scoates Hall TAMU BLDG # 478 Energy Balance Plot during November 2017

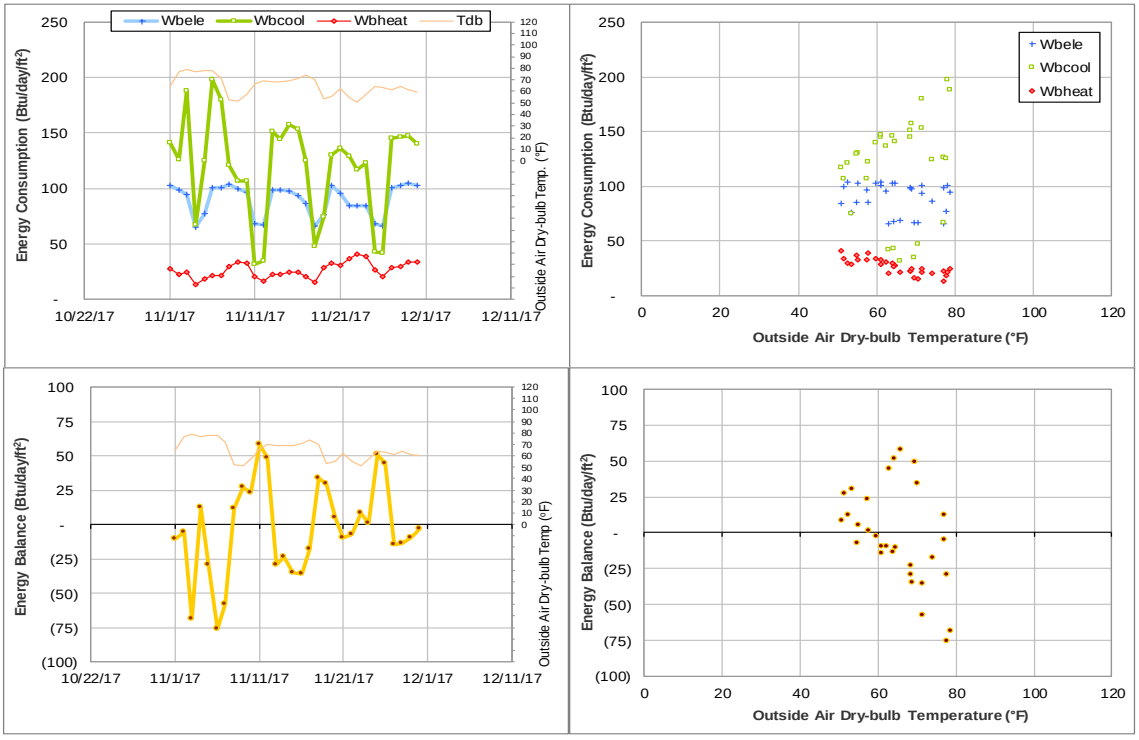


Figure IV-97 Bolton Hall TAMU BLDG # 480 Energy Balance Plot during November 2017

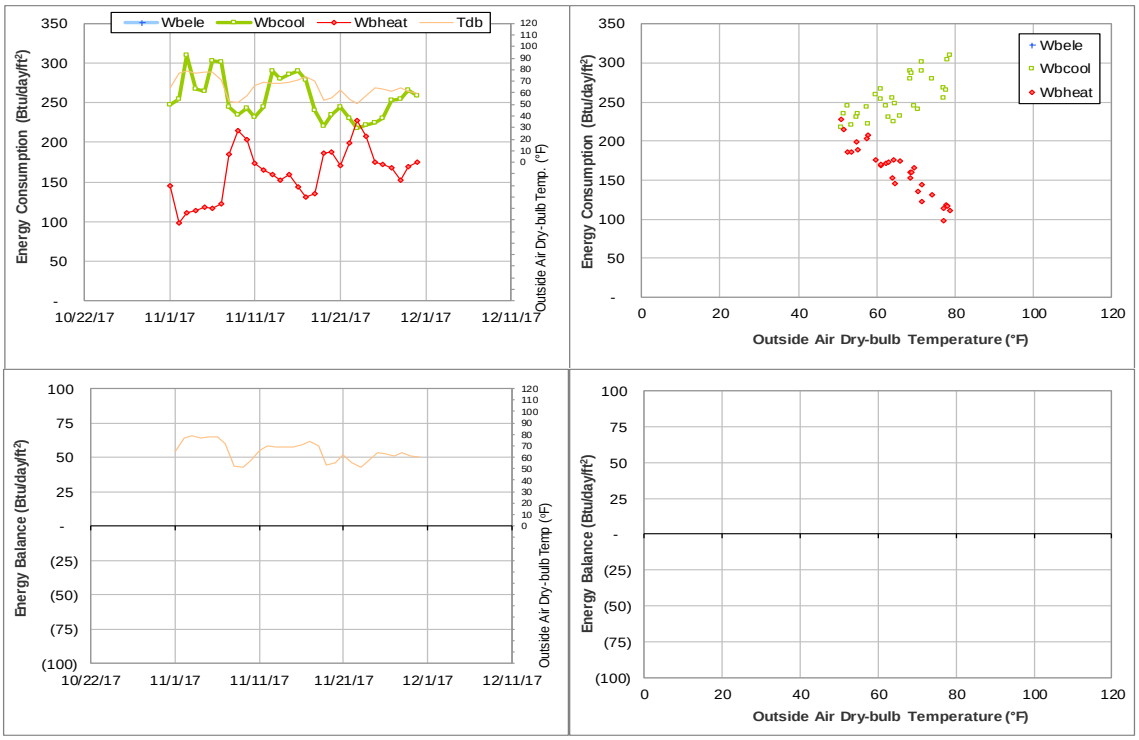


Figure IV-98 Heaton Hall TAMU BLDG # 481 Energy Balance Plot during November 2017

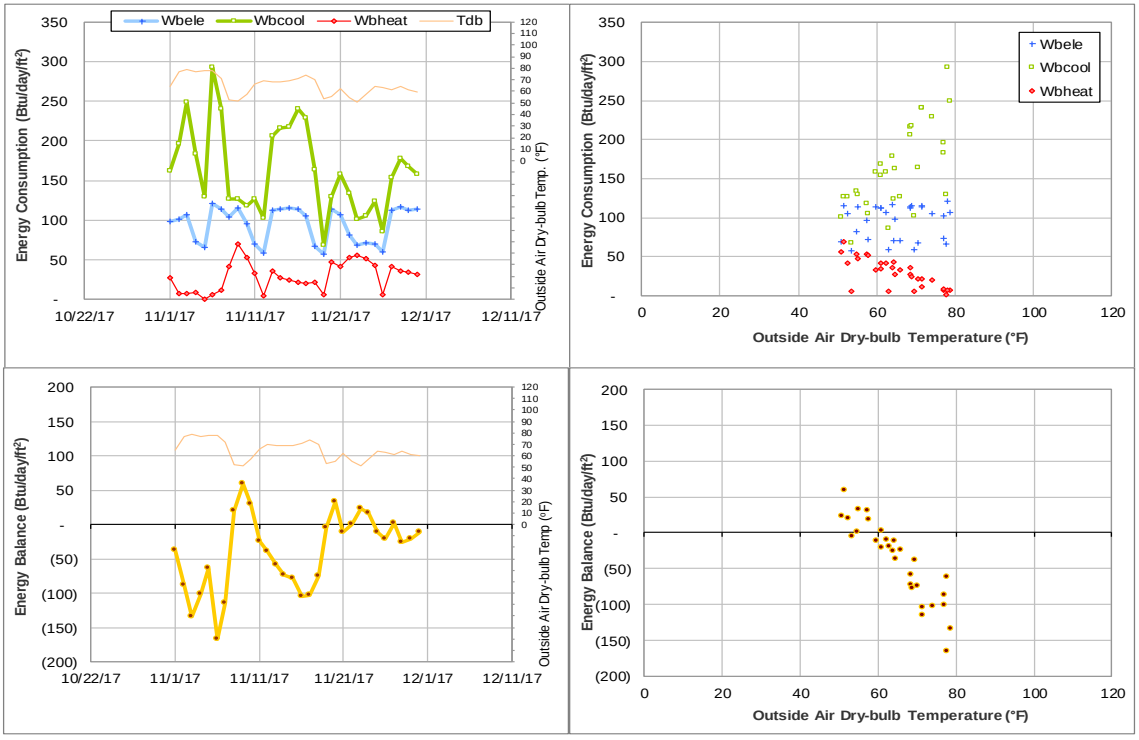


Figure IV-99 Fermier Hall TAMU BLDG # 482 Energy Balance Plot during November 2017

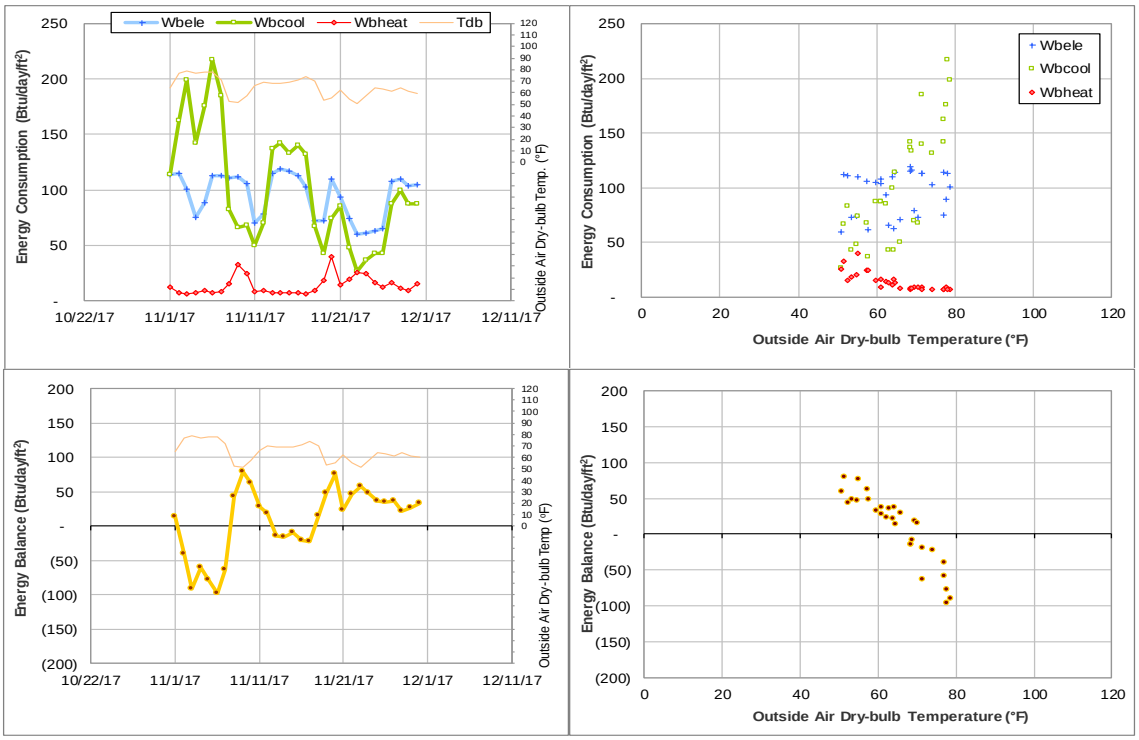


Figure IV-100 Thompson Hall TAMU BLDG # 483 Energy Balance Plot during November 2017

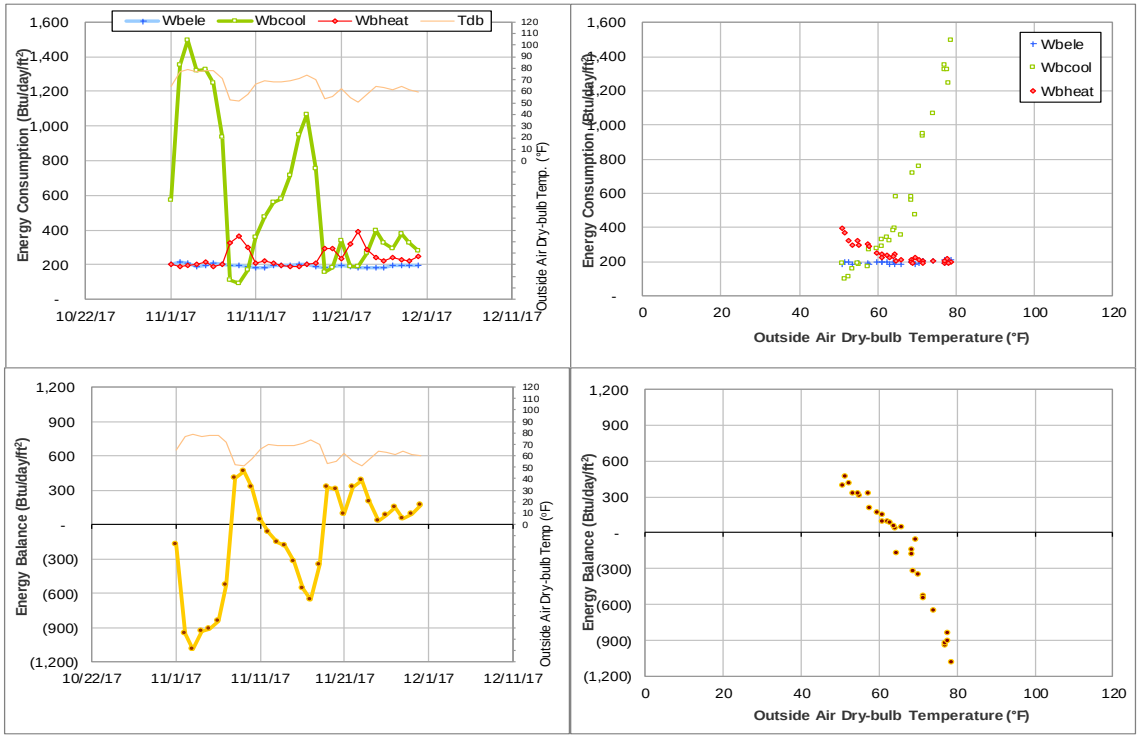


Figure IV-101 Chemistry Building TAMU BLDG # 484 Energy Balance Plot during November 2017

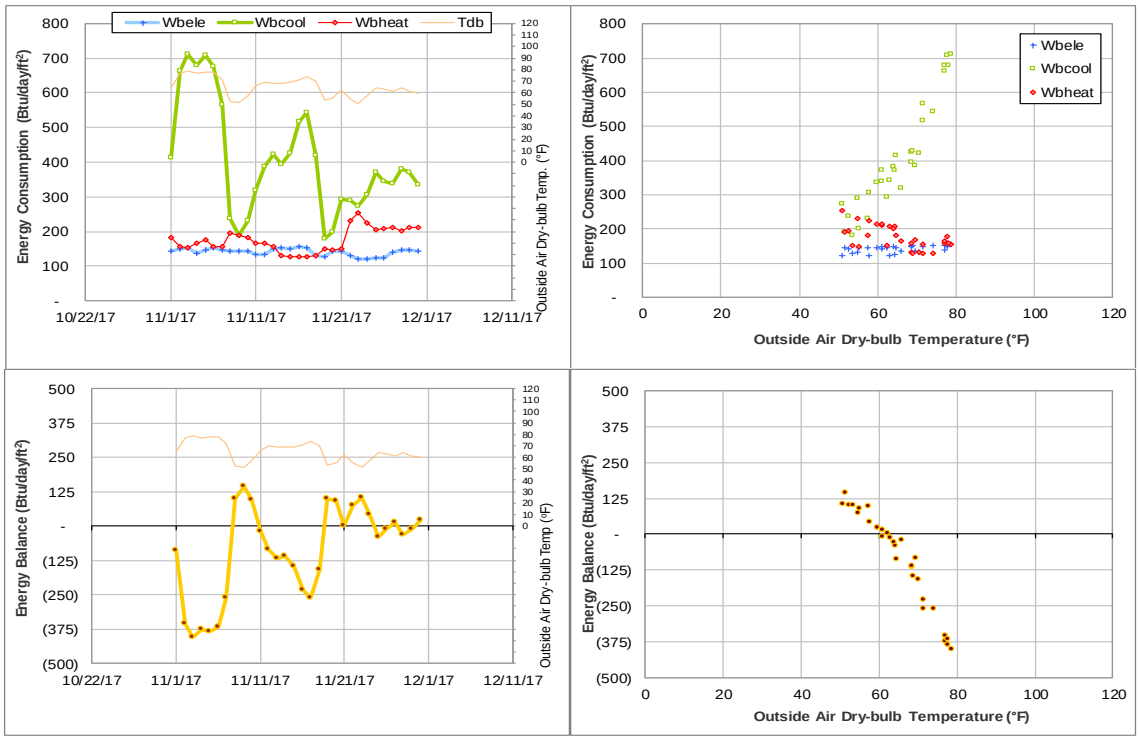


Figure IV-102 Halbouty Geosciences Building TAMU BLDG # 490 Energy Balance Plot during November 2017

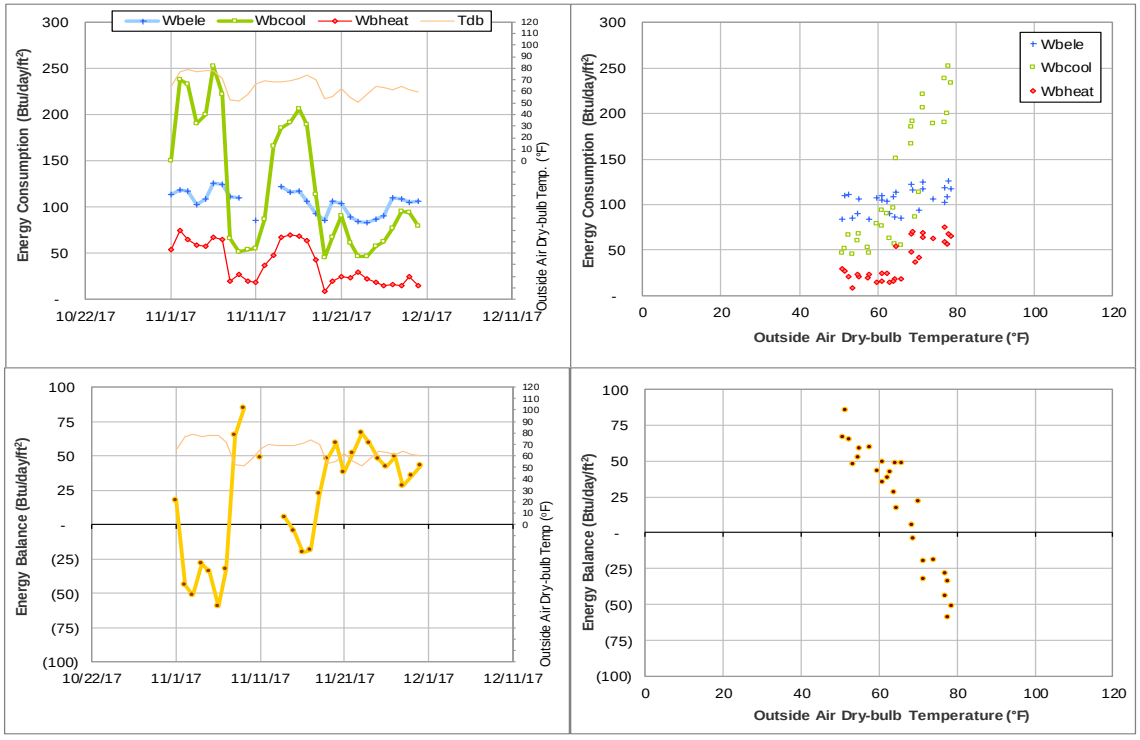


Figure IV-103 Civil Engineering Building TAMU BLDG # 492 Energy Balance Plot during November 2017

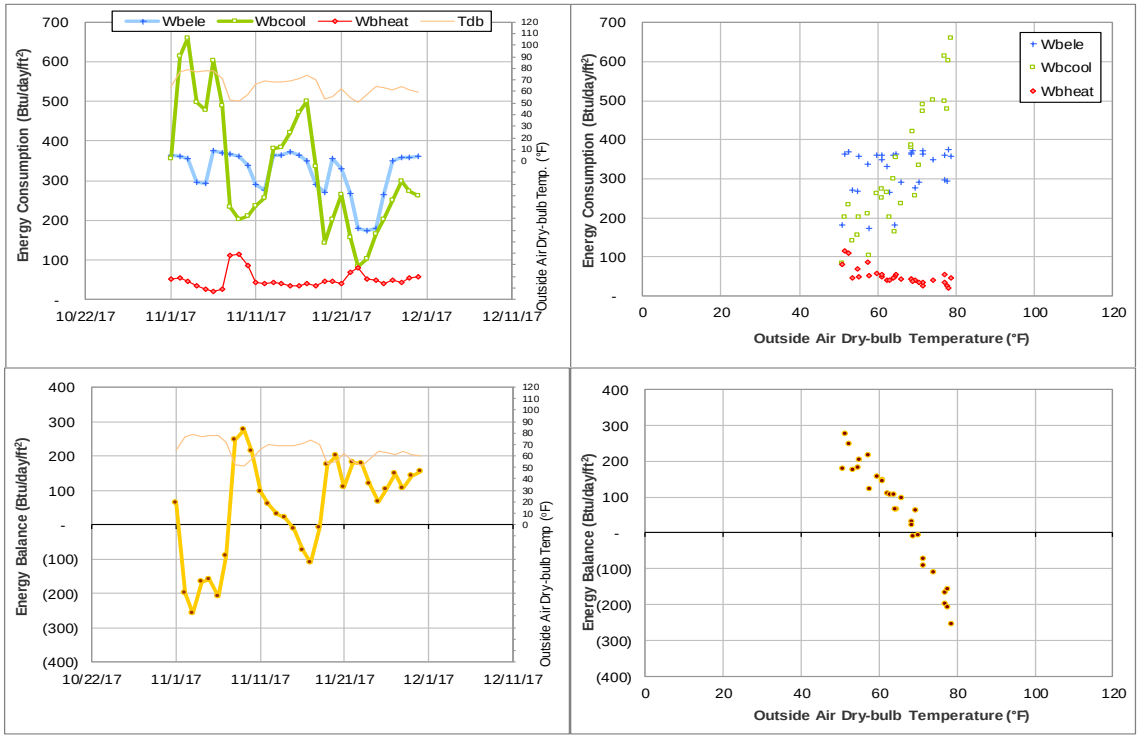


Figure IV-104 Sbisa Dining Hall TAMU BLDG # 495 Energy Balance Plot during November 2017

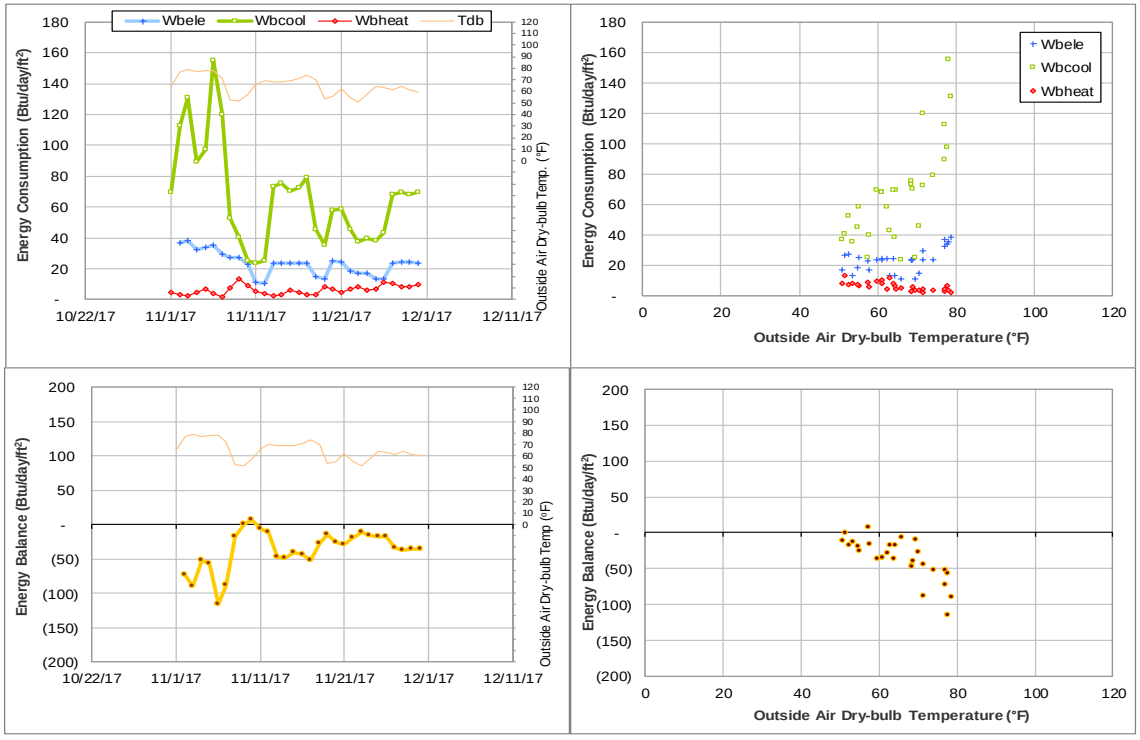


Figure IV-105 Utilities & Energy Services Central Office TAMU BLDG # 496 Energy Balance Plot during November 2017

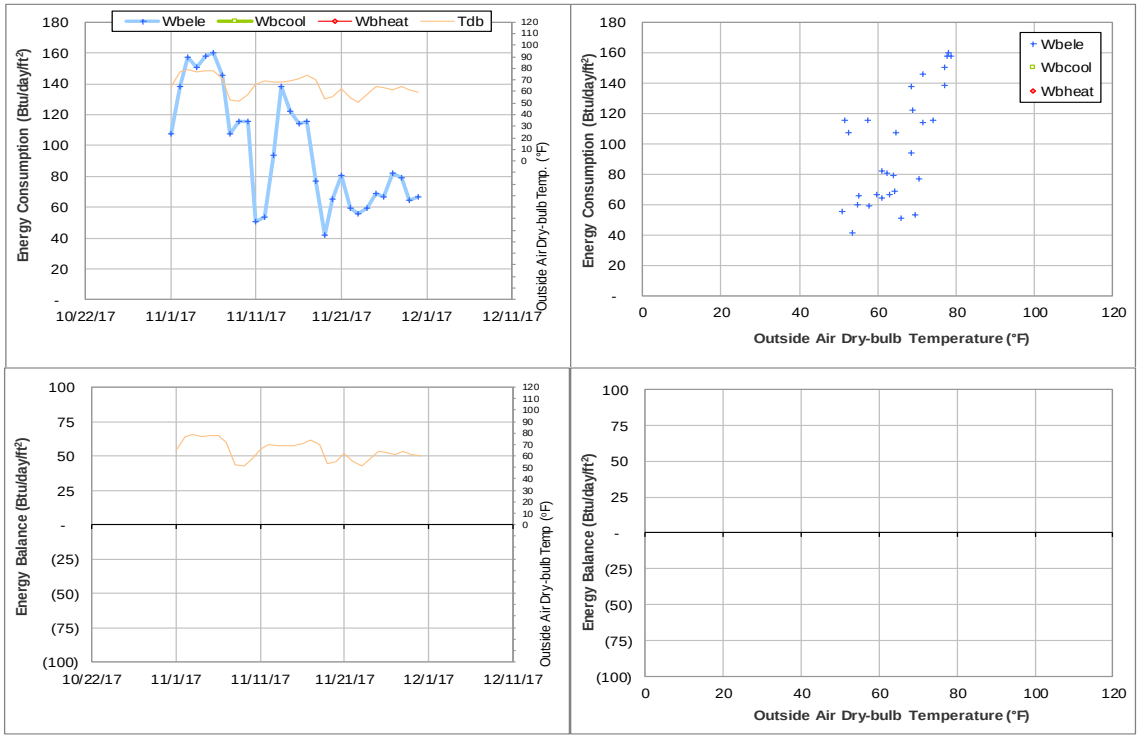


Figure IV-106 Concrete Materials Laboratory TAMU BLDG # 501 Energy Balance Plot during November 2017

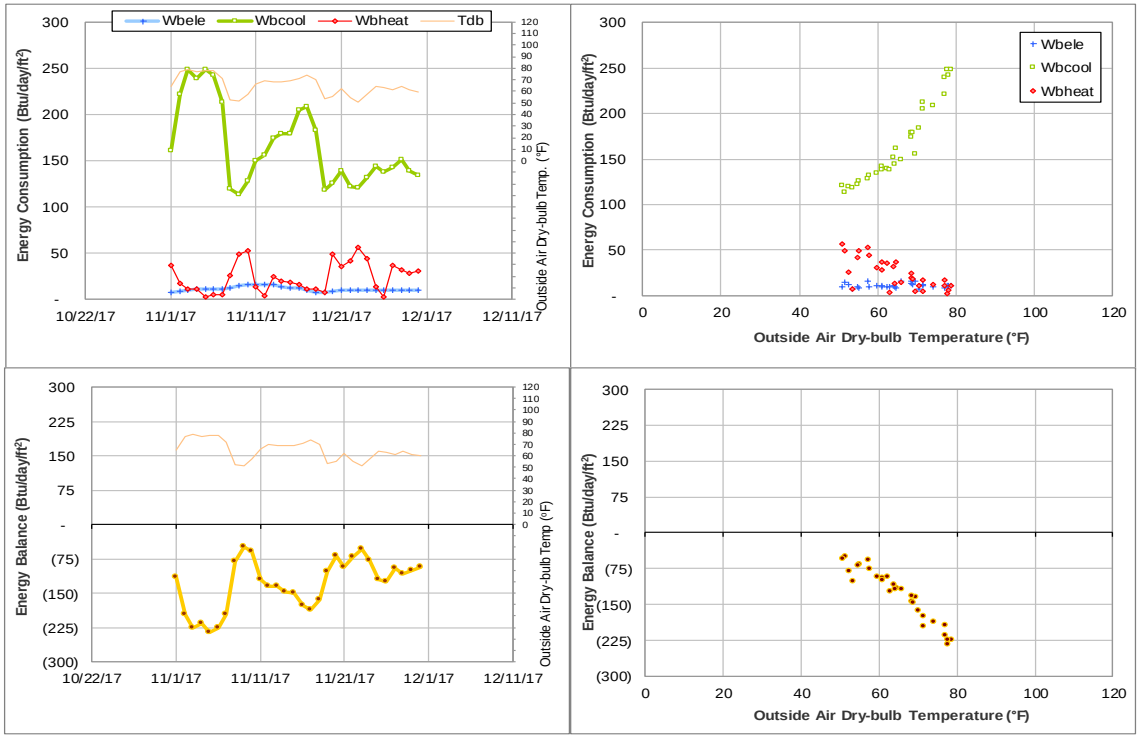


Figure IV-107 Nagle Hall TAMU BLDG # 506 Energy Balance Plot during November 2017

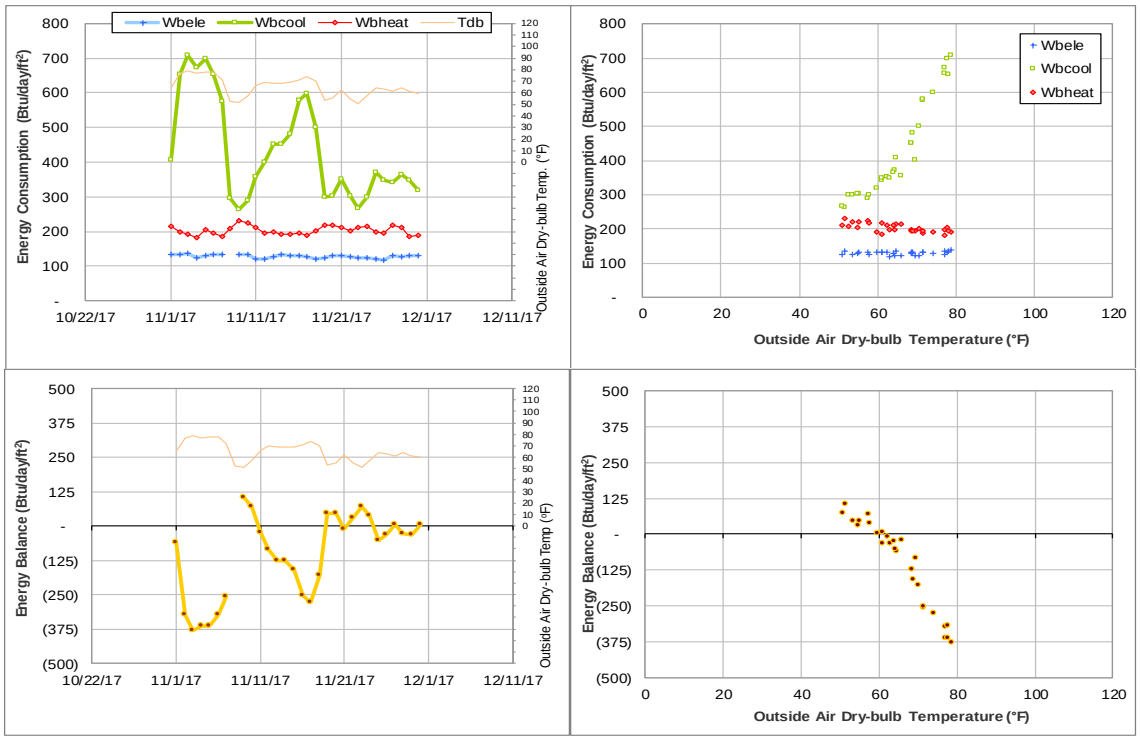


Figure IV-108 Veterinary Medical Science Building TAMU BLDG # 507 Energy Balance Plot during November 2017

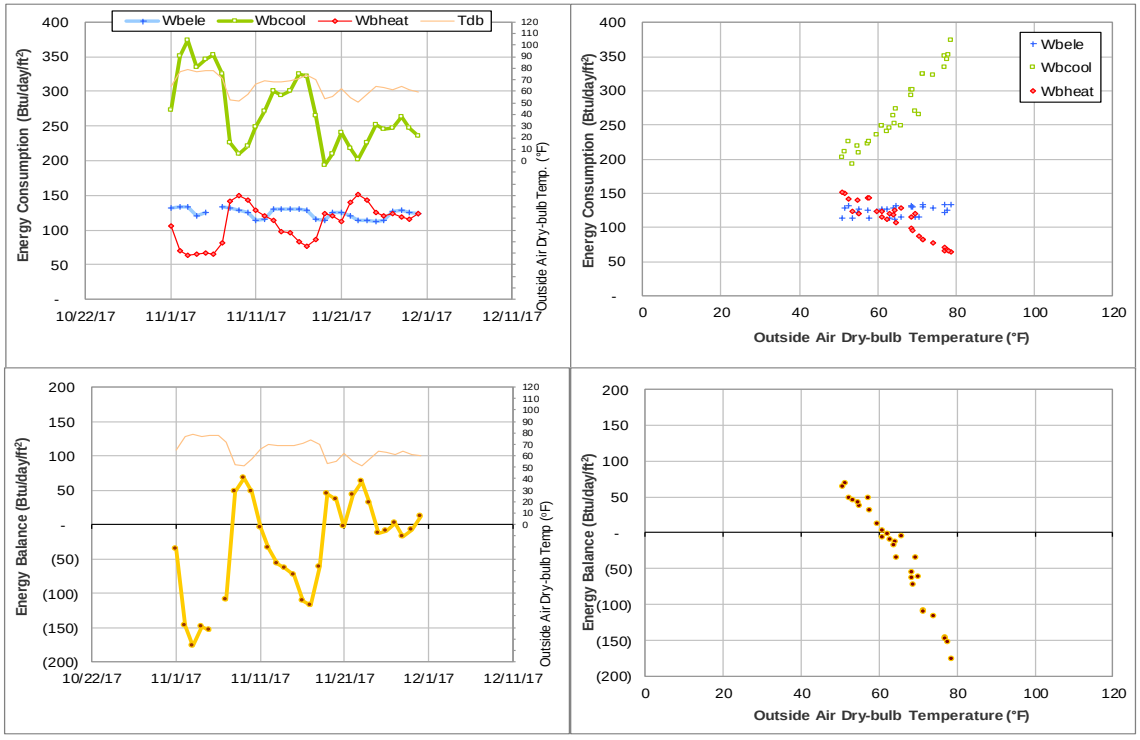


Figure IV-109 Veterinary Teaching Hospital and Med Adm TAMU BLDG # 508-1026 Energy Balance Plot during November 2017

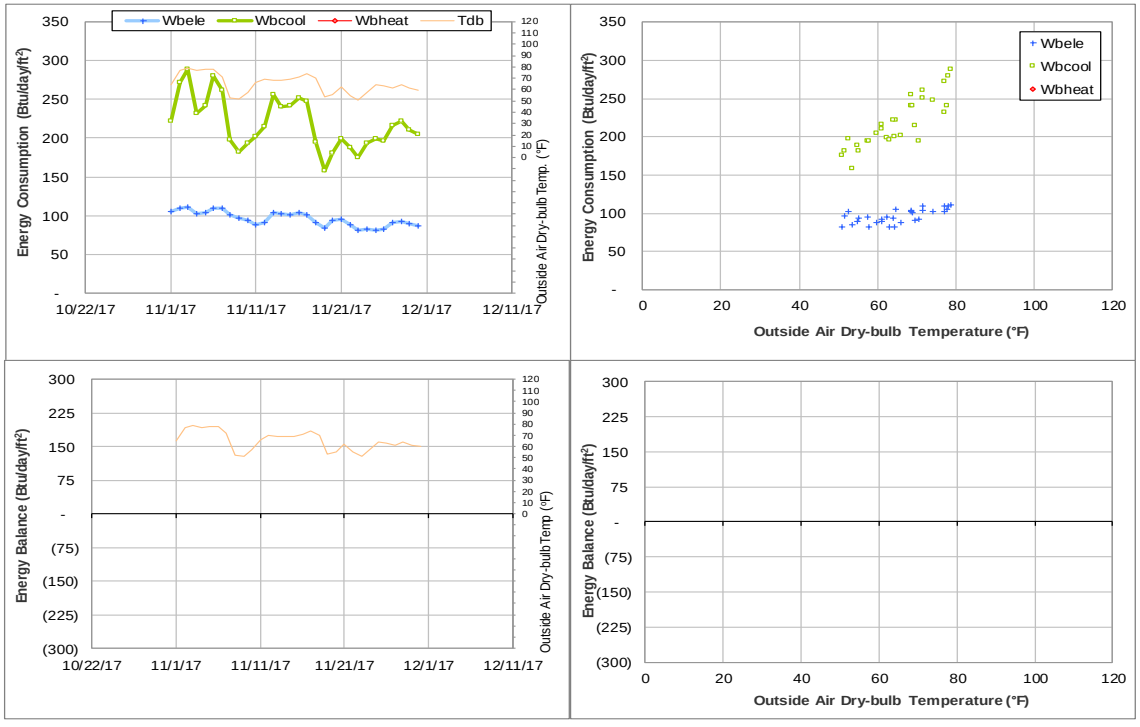


Figure IV-110 Veterinary Teaching Hospital TAMU BLDG # 508 Energy Balance Plot during November 2017

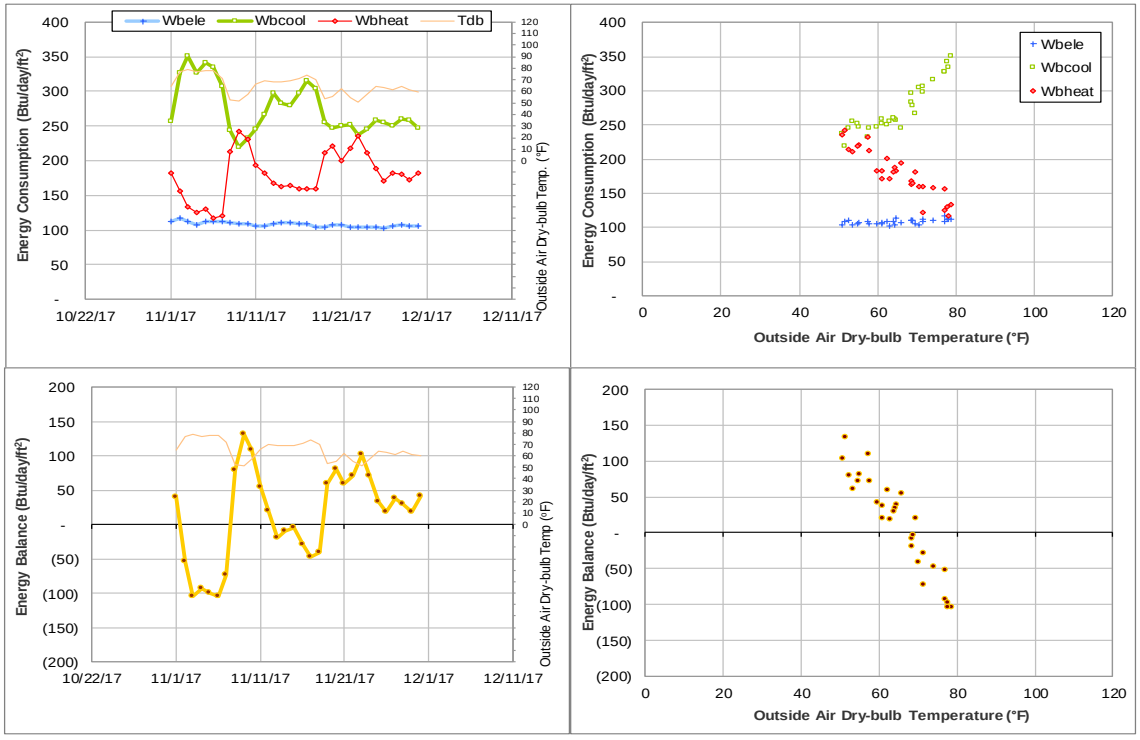


Figure IV-111 Heep Laboratory Building TAMU BLDG # 511 Energy Balance Plot during November 2017

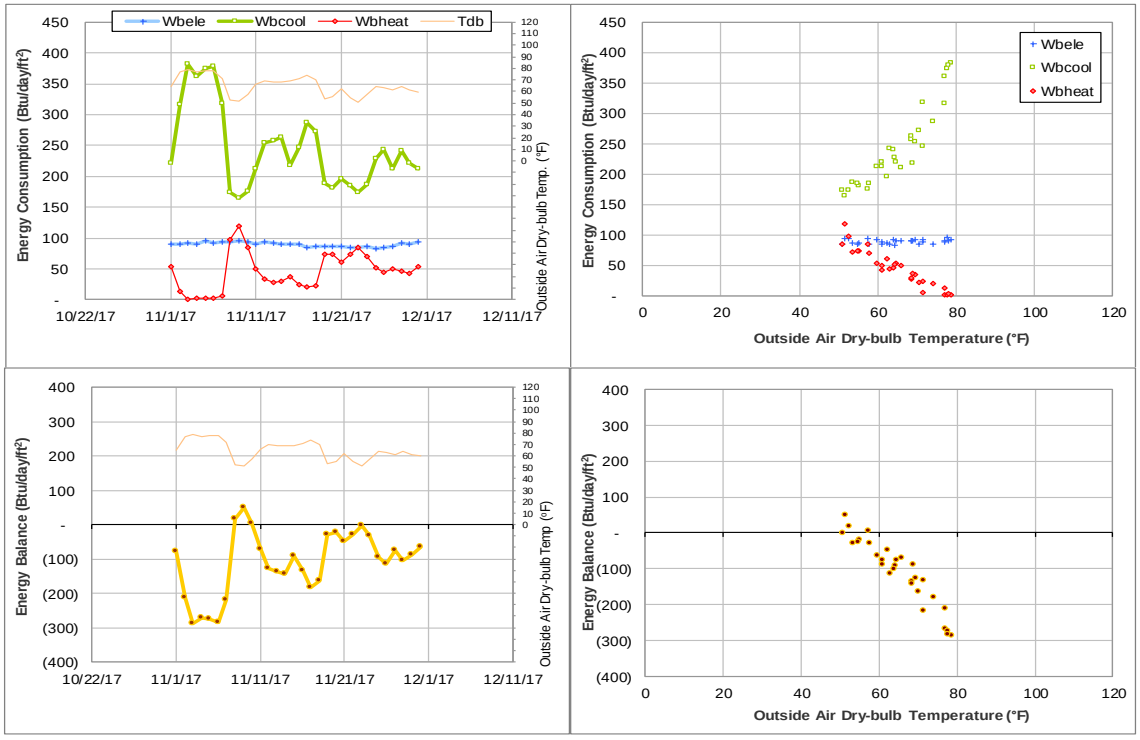


Figure IV-112 All Faiths Chapel TAMU BLDG # 512 Energy Balance Plot during November 2017

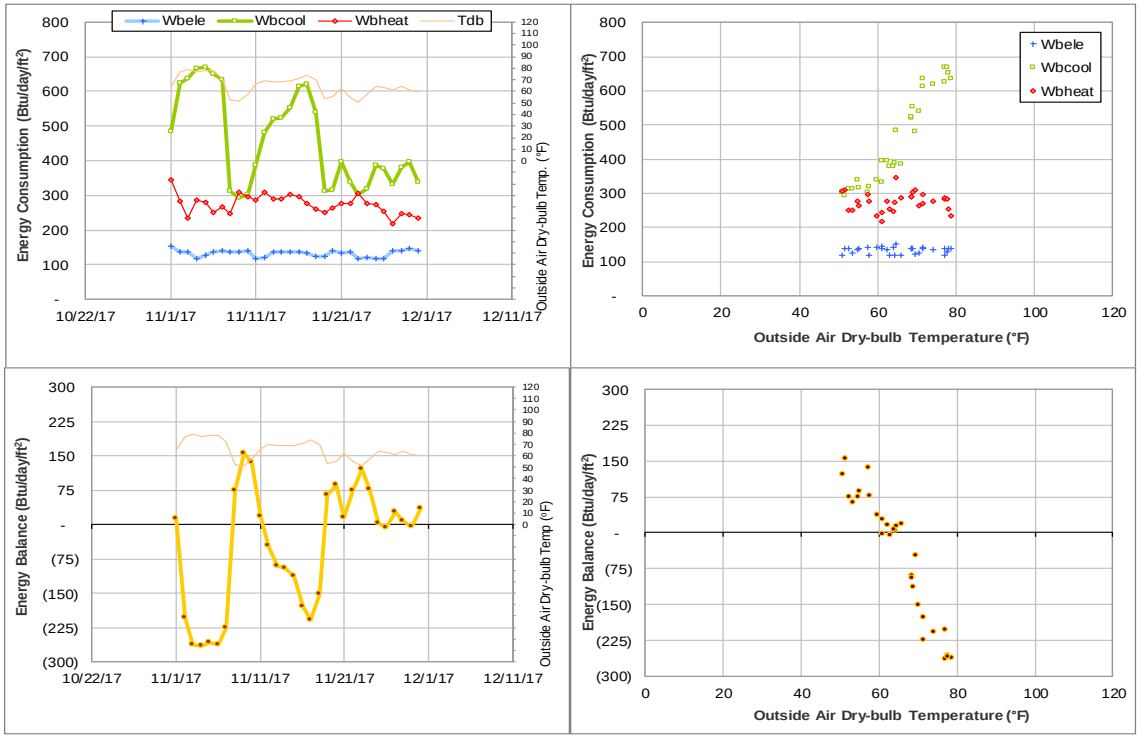


Figure IV-113 Doherty Building TAMU BLDG # 513 Energy Balance Plot during November 2017

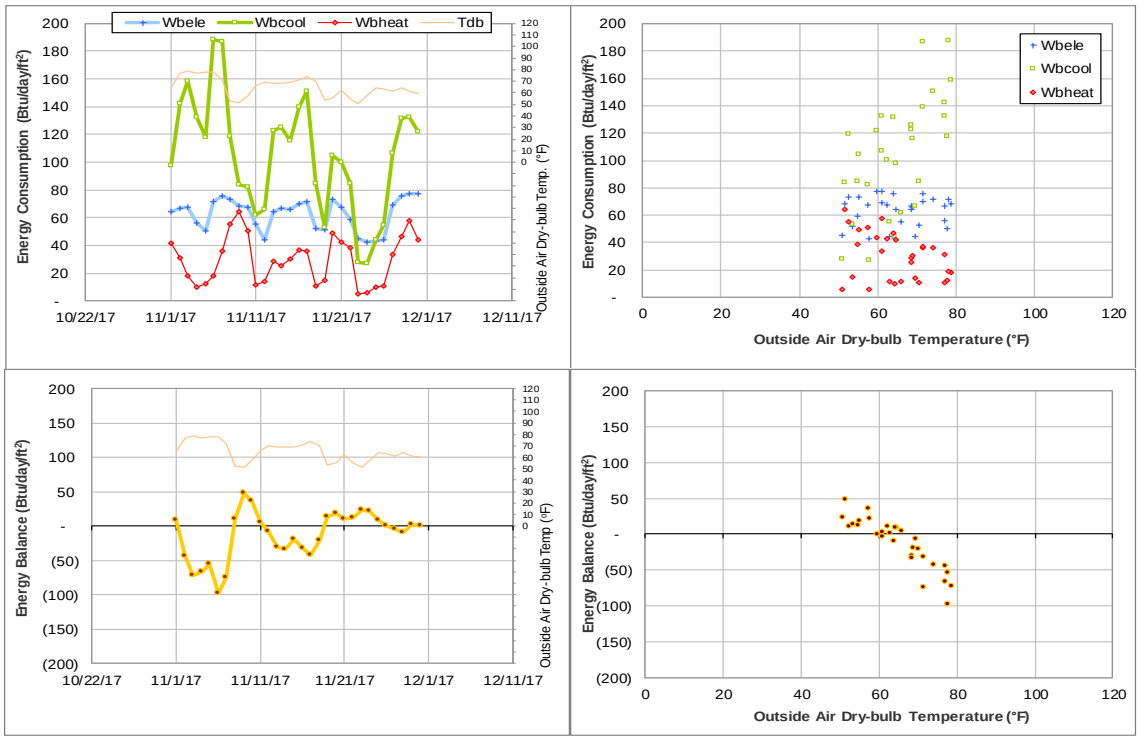


Figure IV-114 Munnerlyn Astronomy & Space Sciences Engineering TAMU BLDG # 514 Energy Balance Plot during November 2017

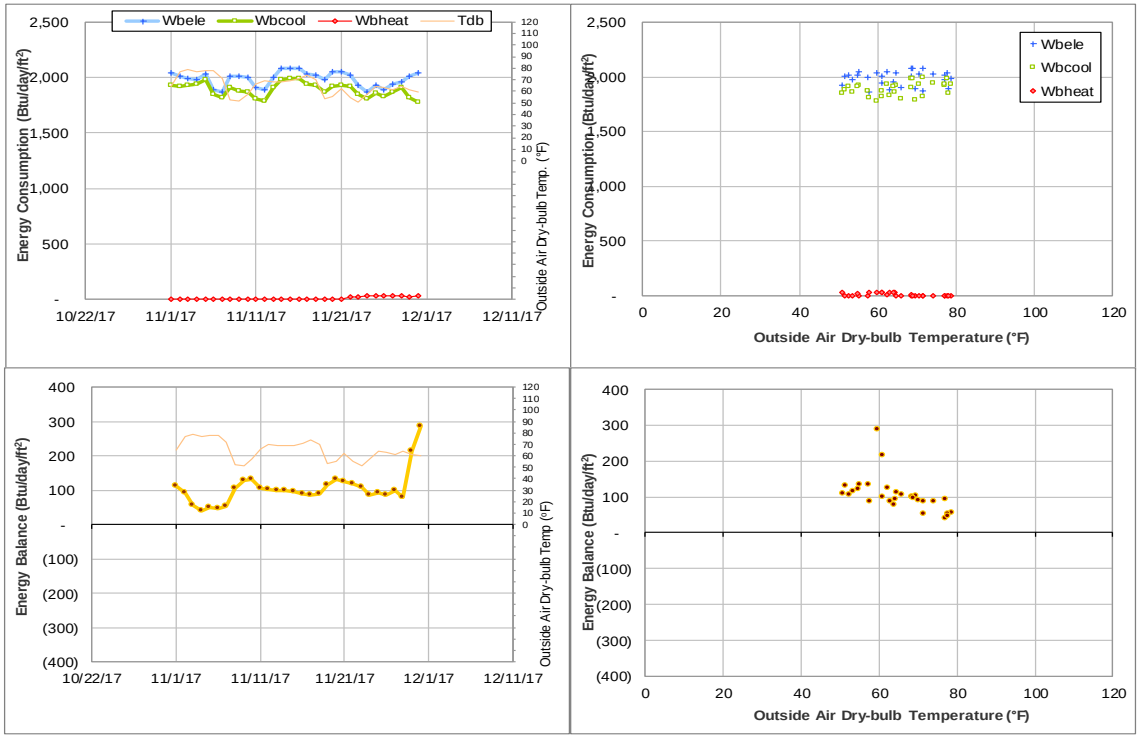


Figure IV-115 Computing Services Center TAMU BLDG # 516 Energy Balance Plot during November 2017

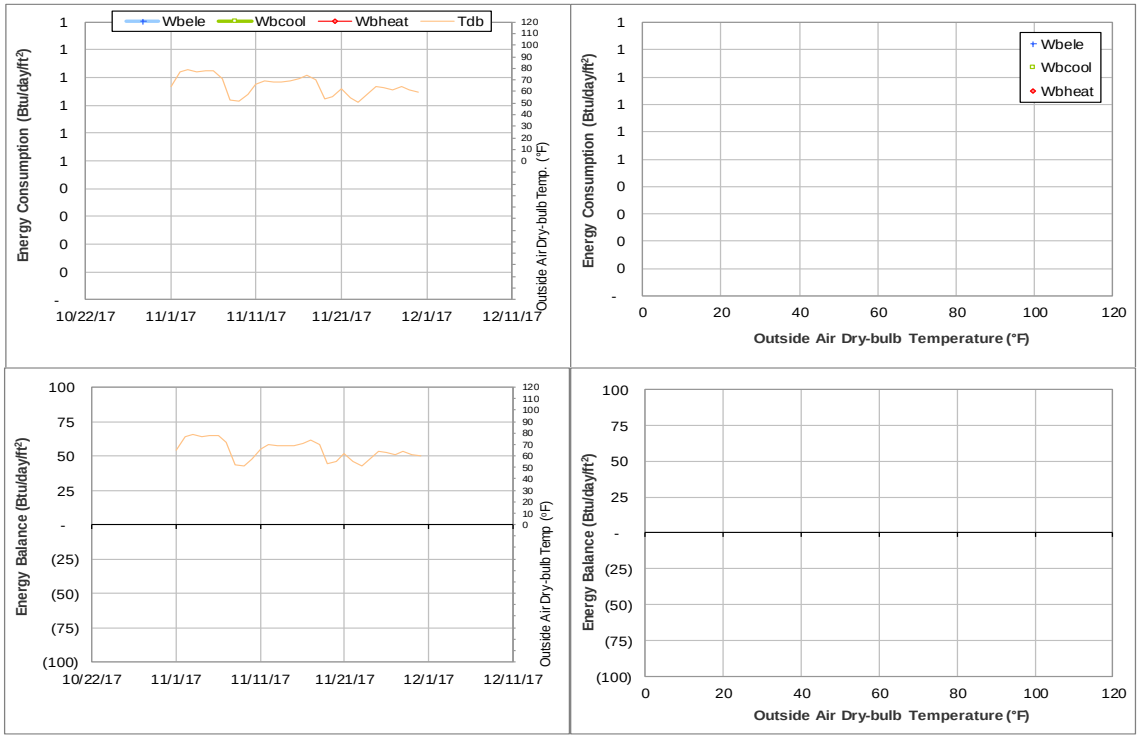


Figure IV-116 Zachry Engineering Education Complex TAMU BLDG # 518 Energy Balance Plot during November 2017

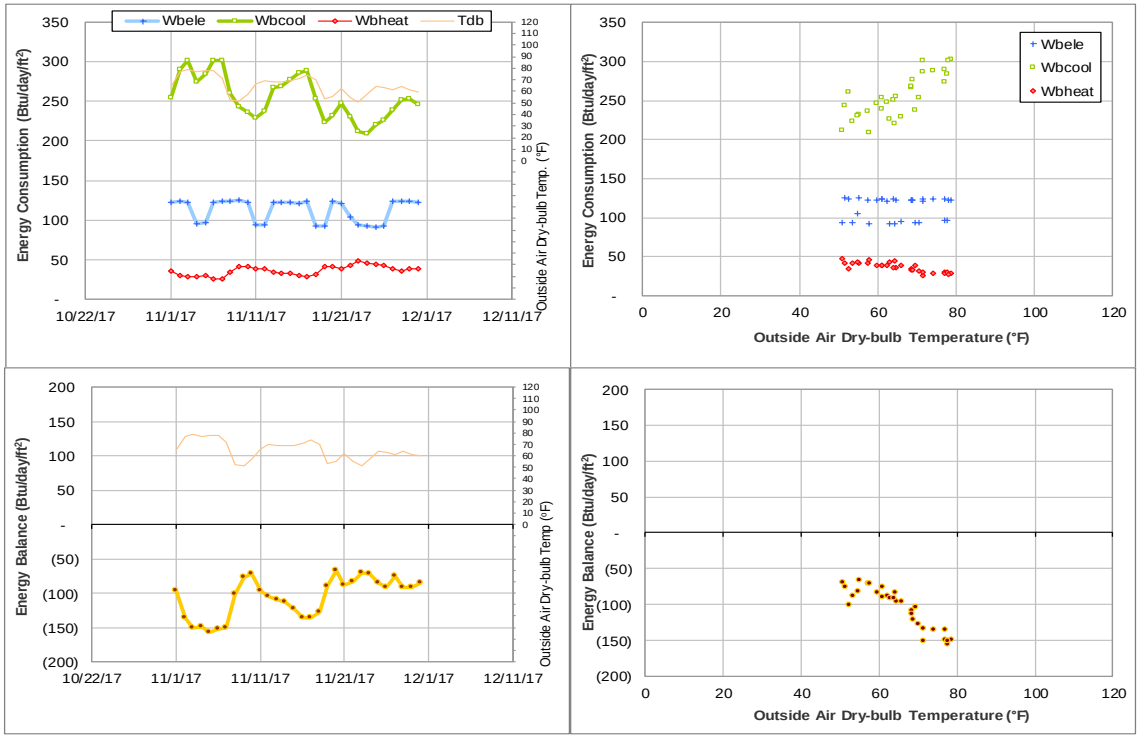


Figure IV-117 Beutel Health Center TAMU BLDG # 520 Energy Balance Plot during November 2017

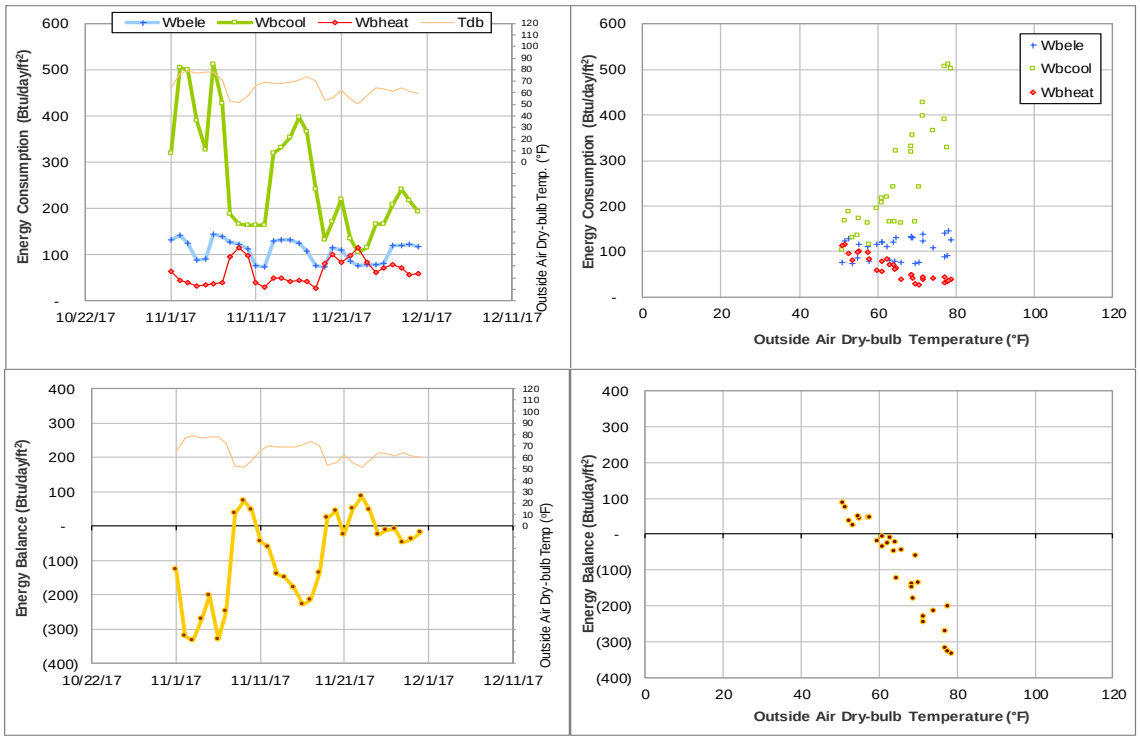


Figure IV-118 Heldenfels Hall TAMU BLDG # 521 Energy Balance Plot during November 2017

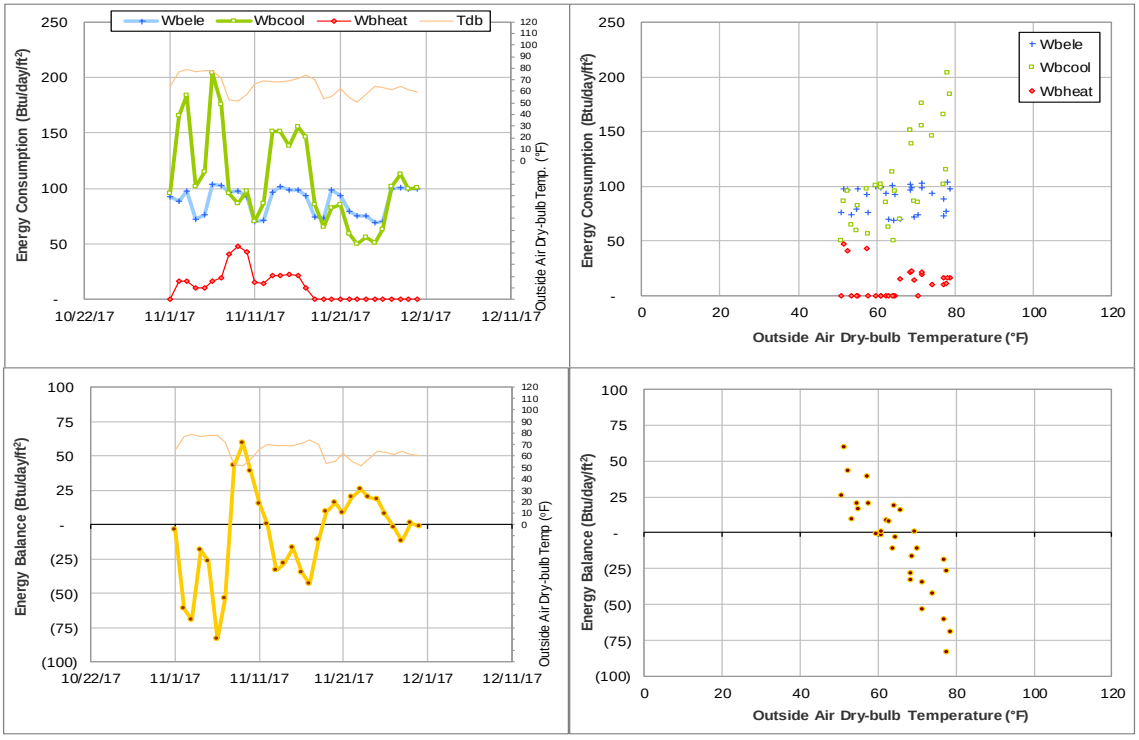


Figure IV-119 Blocker building TAMU BLDG # 524 Energy Balance Plot during November 2017

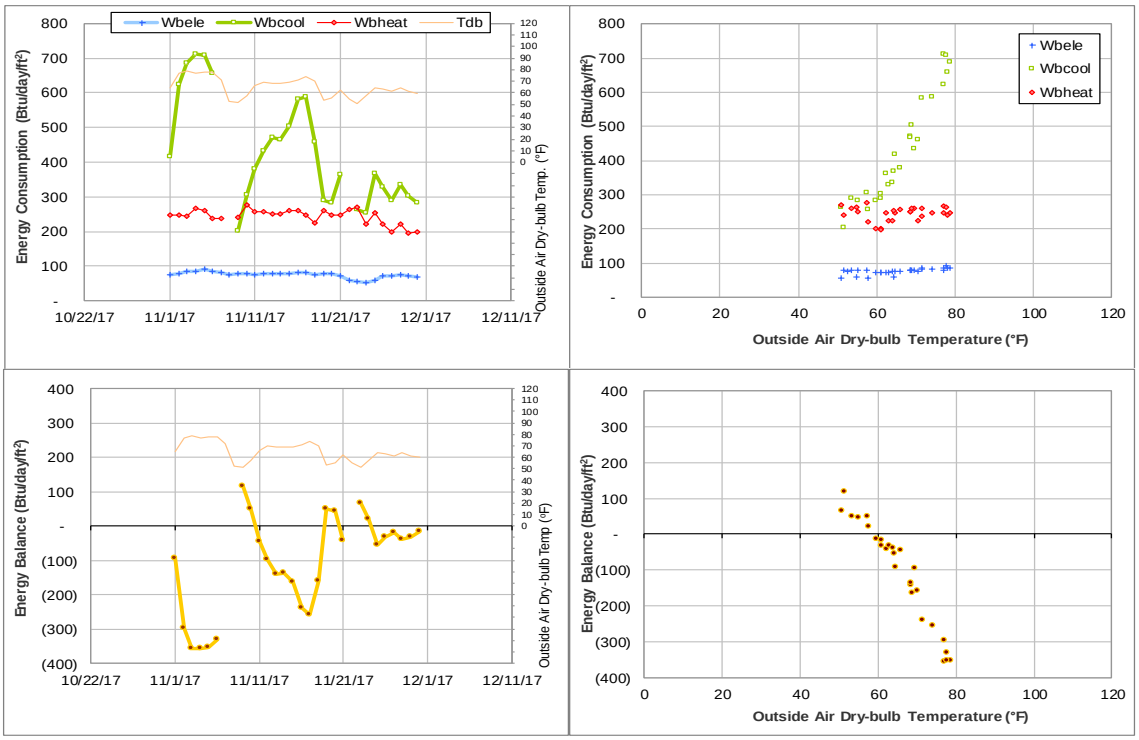


Figure IV-120 Clements Residence Hall TAMU BLDG # 548 Energy Balance Plot during November 2017

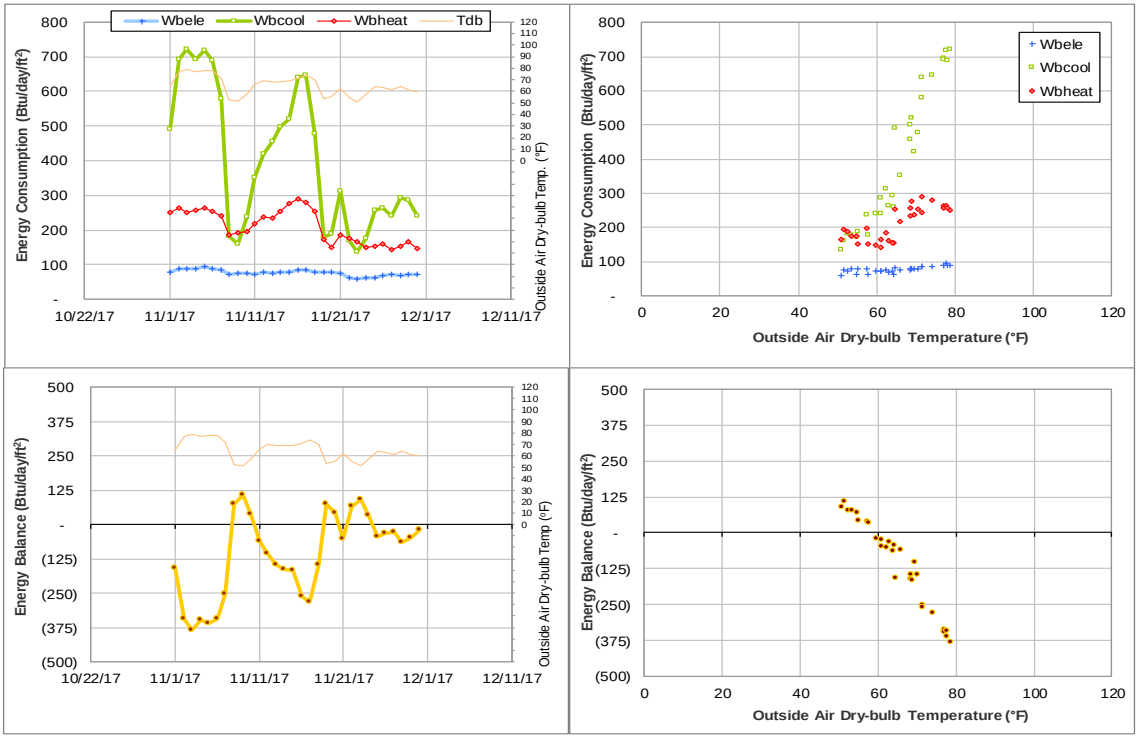


Figure IV-121 Haas Residence Hall TAMU BLDG # 549 Energy Balance Plot during November 2017

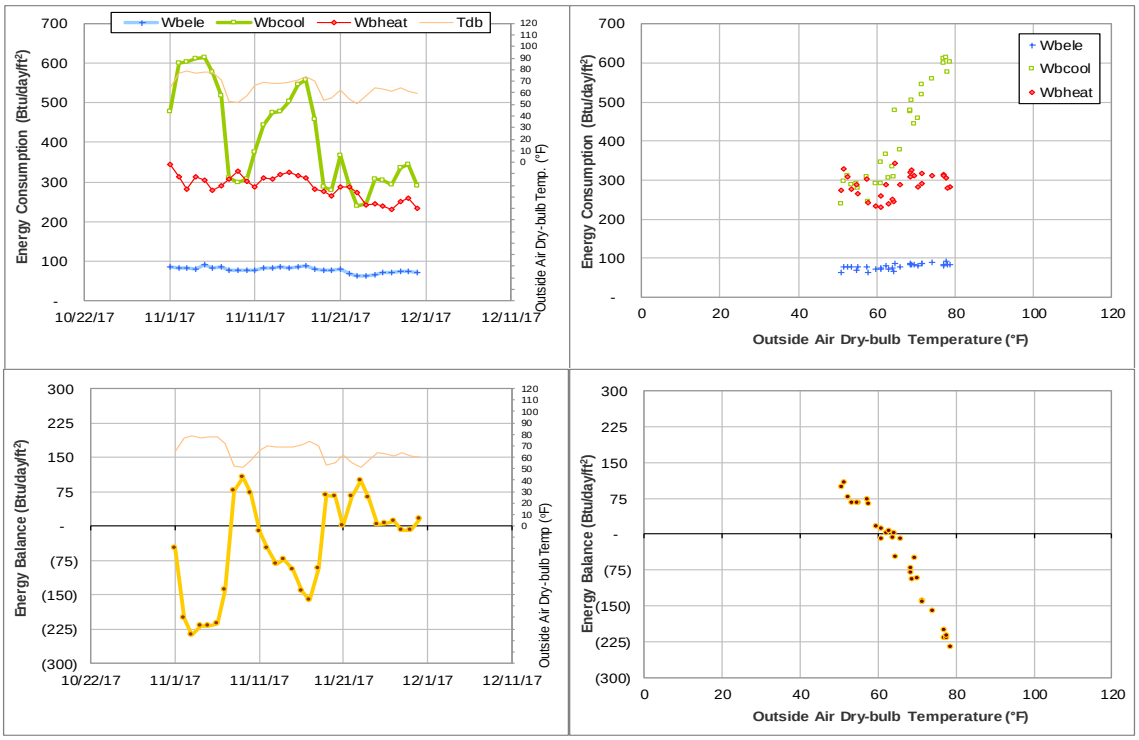


Figure IV-122 McFadden Residence Hall TAMU BLDG # 550 Energy Balance Plot during November 2017

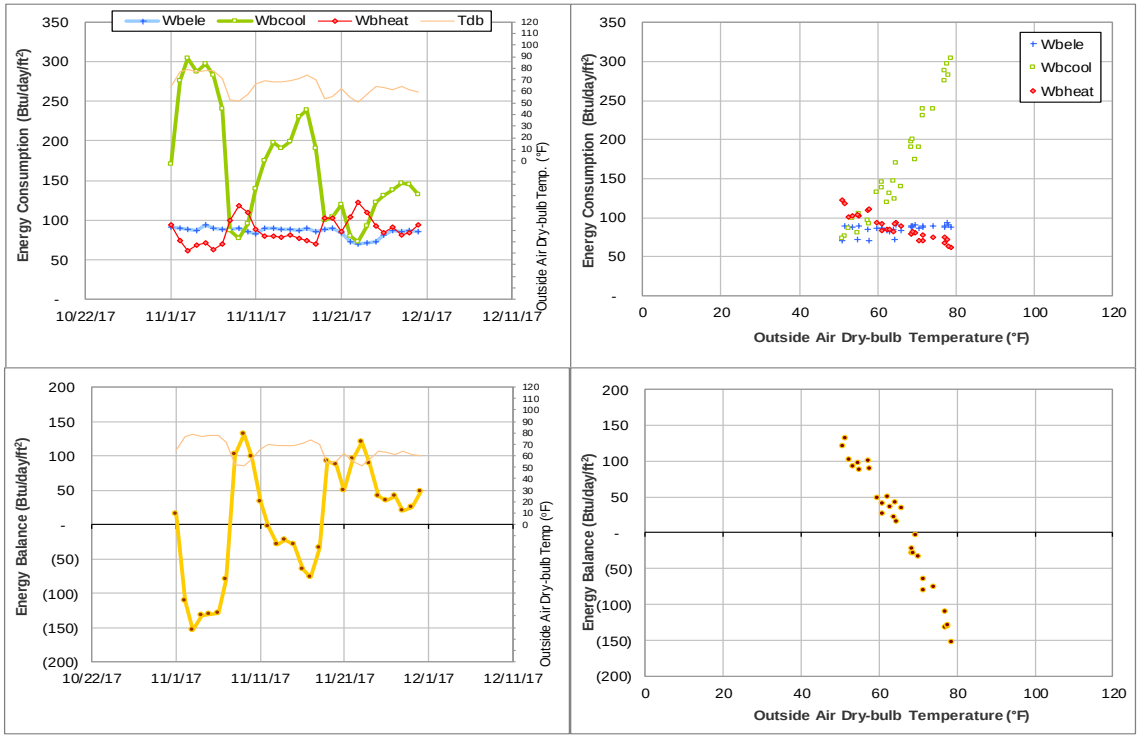


Figure IV-123 Neeley Residence Hall TAMU BLDG # 652 Energy Balance Plot during November 2017

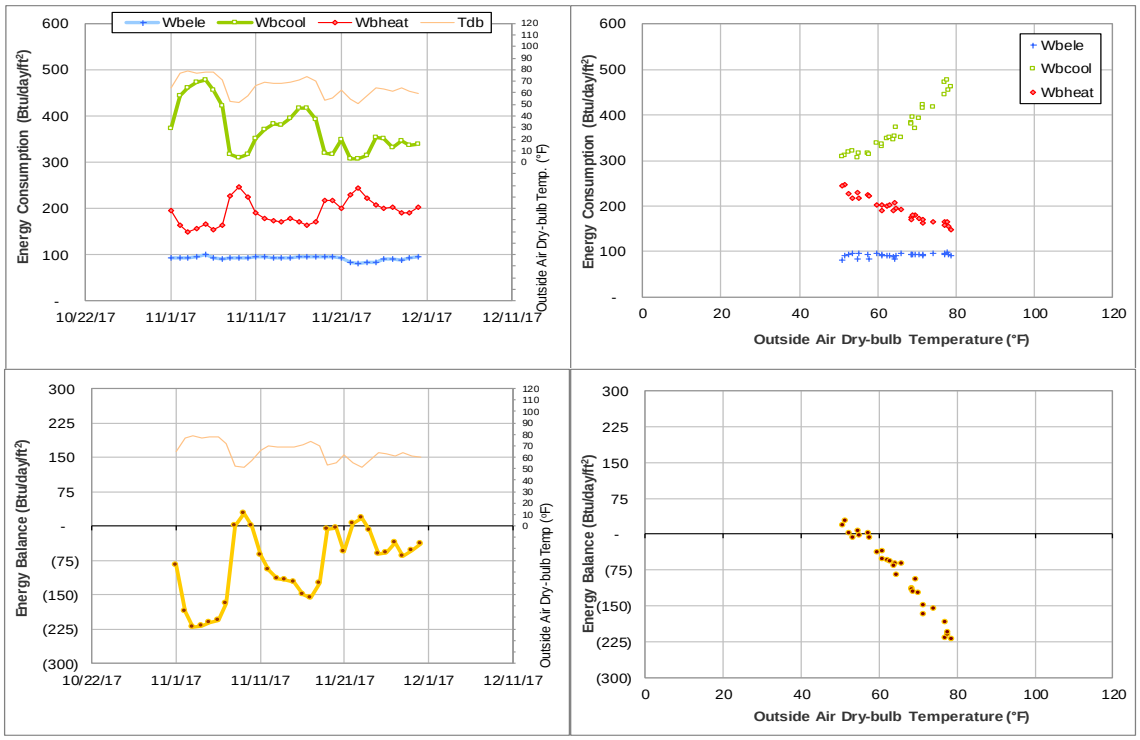


Figure IV-124 Hobby Residence Hall TAMU BLDG # 653 Energy Balance Plot during November 2017

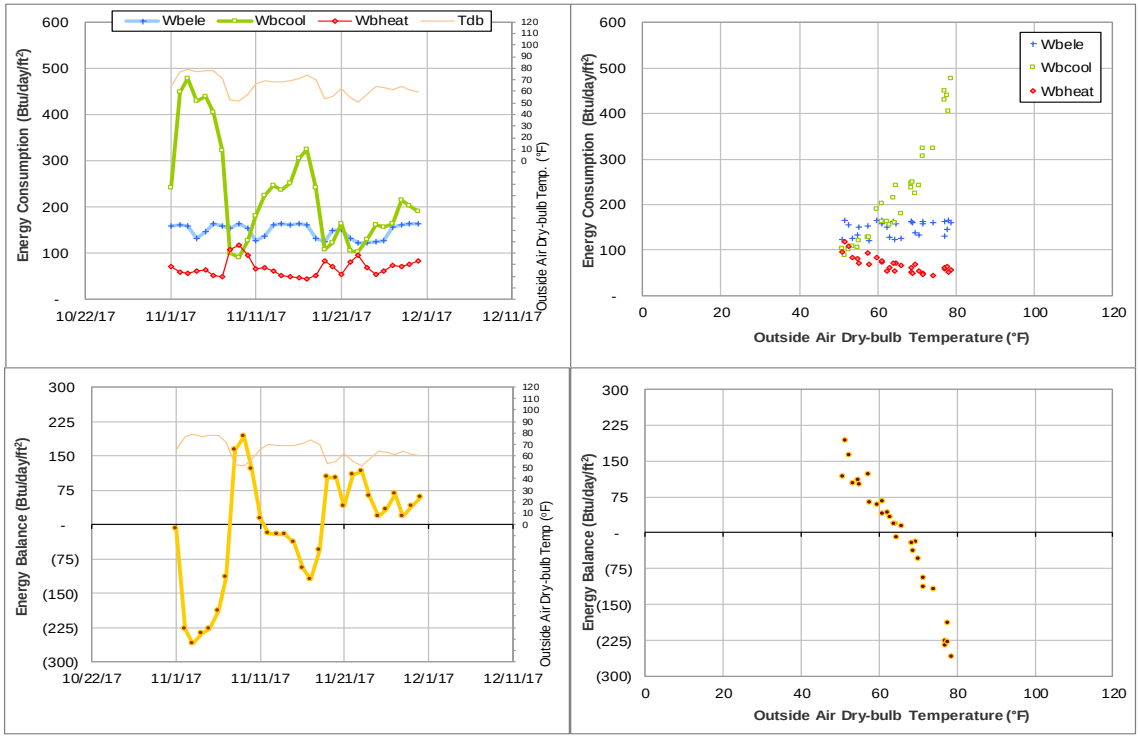


Figure IV-125 Wisenbaker Engineering Research Center TAMU BLDG # 682 Energy Balance Plot during November 2017

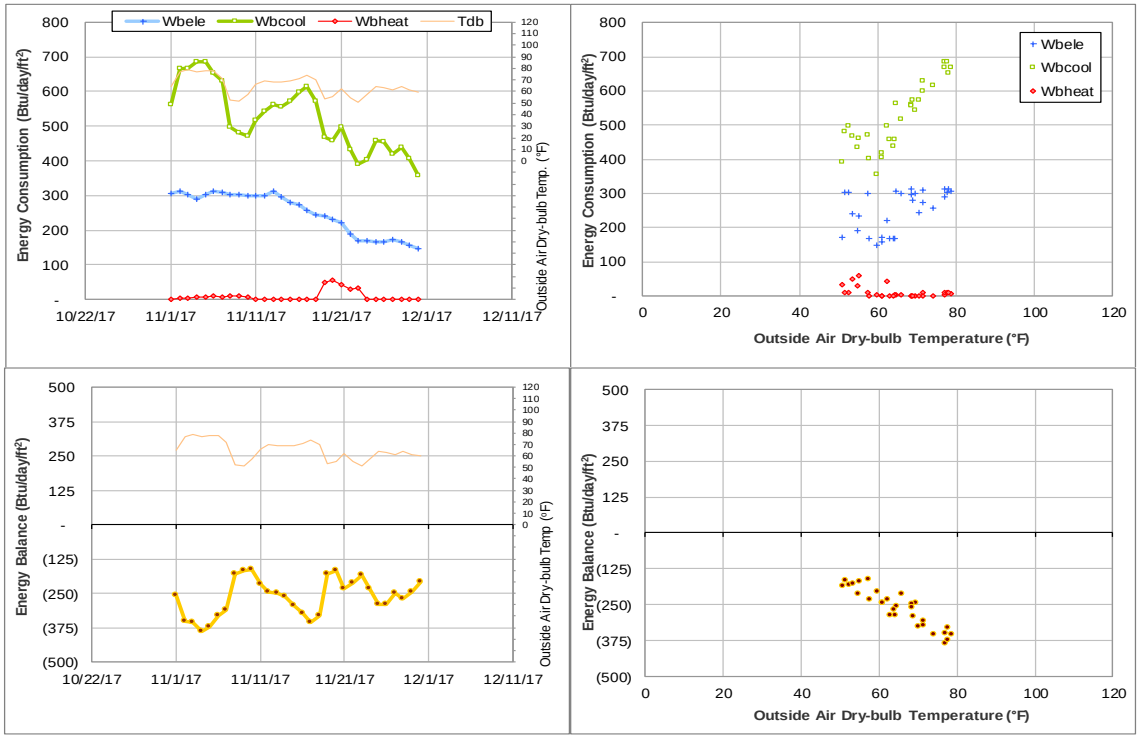


Figure IV-126 McNew Laboratory TAMU BLDG # 740 Energy Balance Plot during November 2017

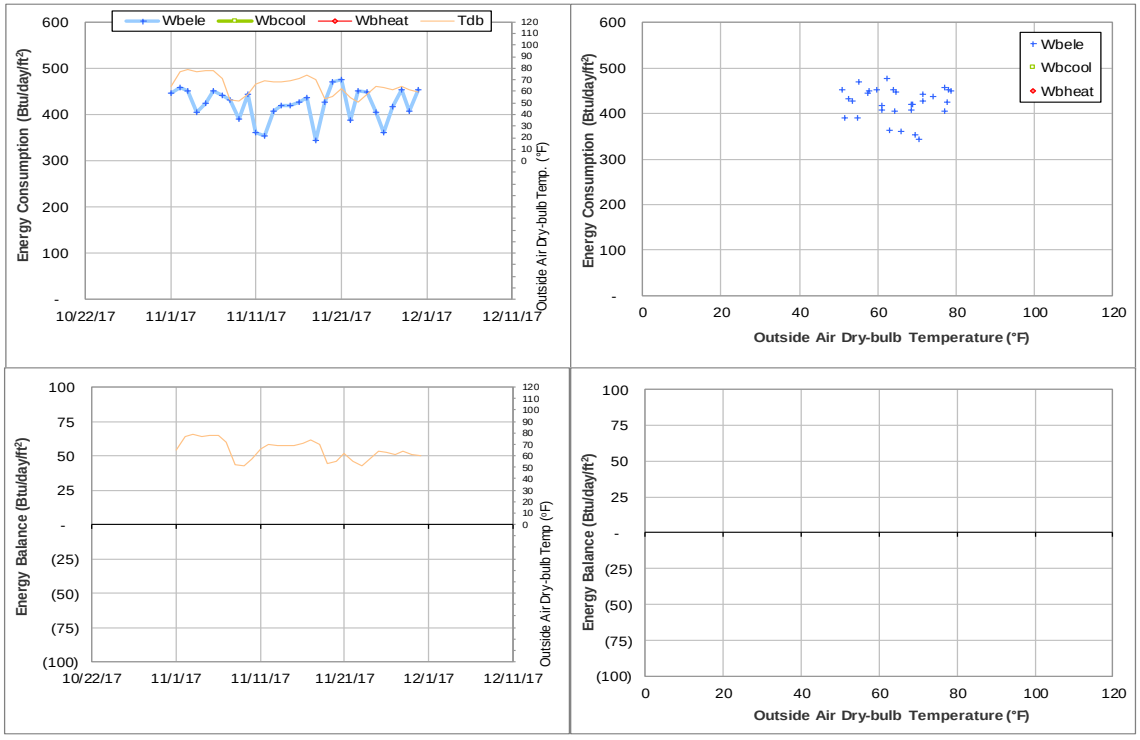


Figure IV-127 Soil Testing Labs TAMU BLDG # 806 Energy Balance Plot during November 2017

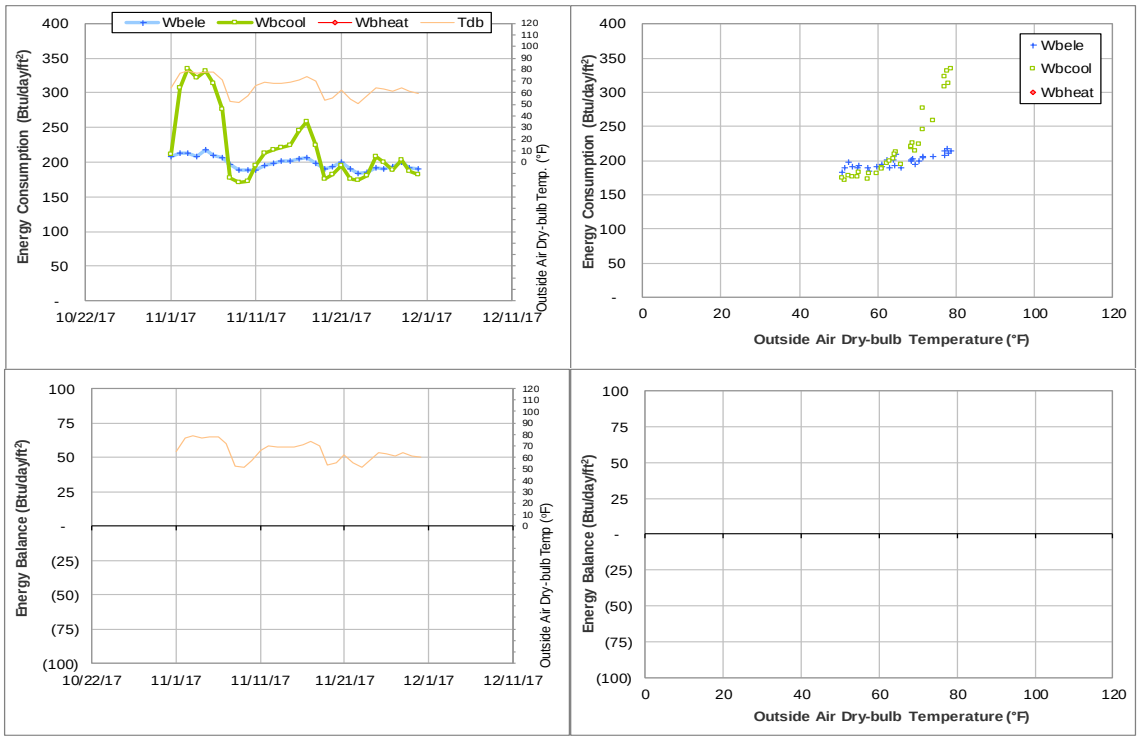


Figure IV-128 Entomology Research Lab TAMU BLDG # 815 Energy Balance Plot during November 2017

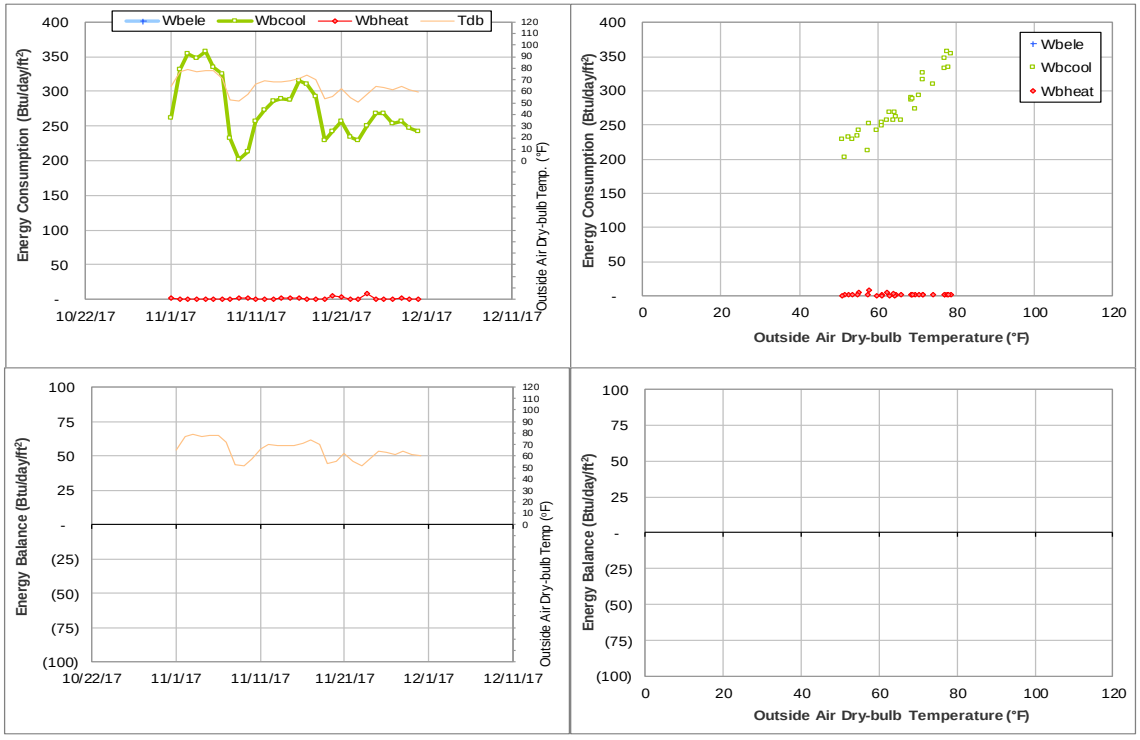


Figure IV-129 TVMC-Small Animal Building TAMU BLDG # 880 Energy Balance Plot during November 2017

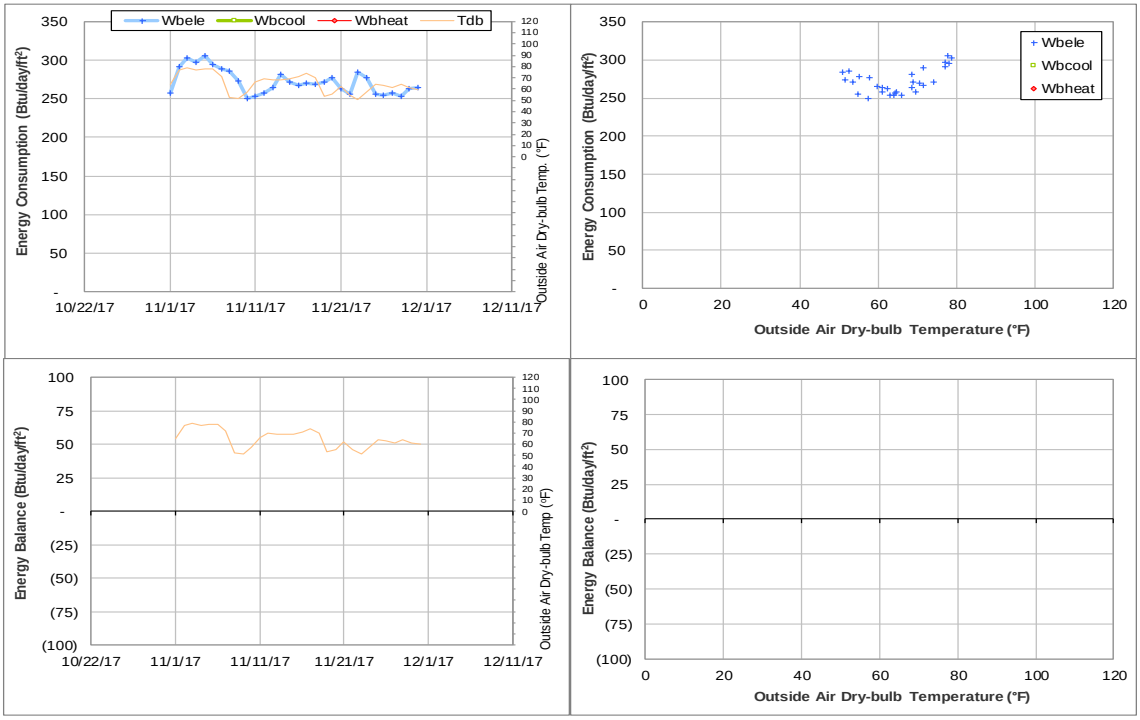


Figure IV-130 Dollar Data Center TAMU BLDG # 971 Energy Balance Plot during November 2017

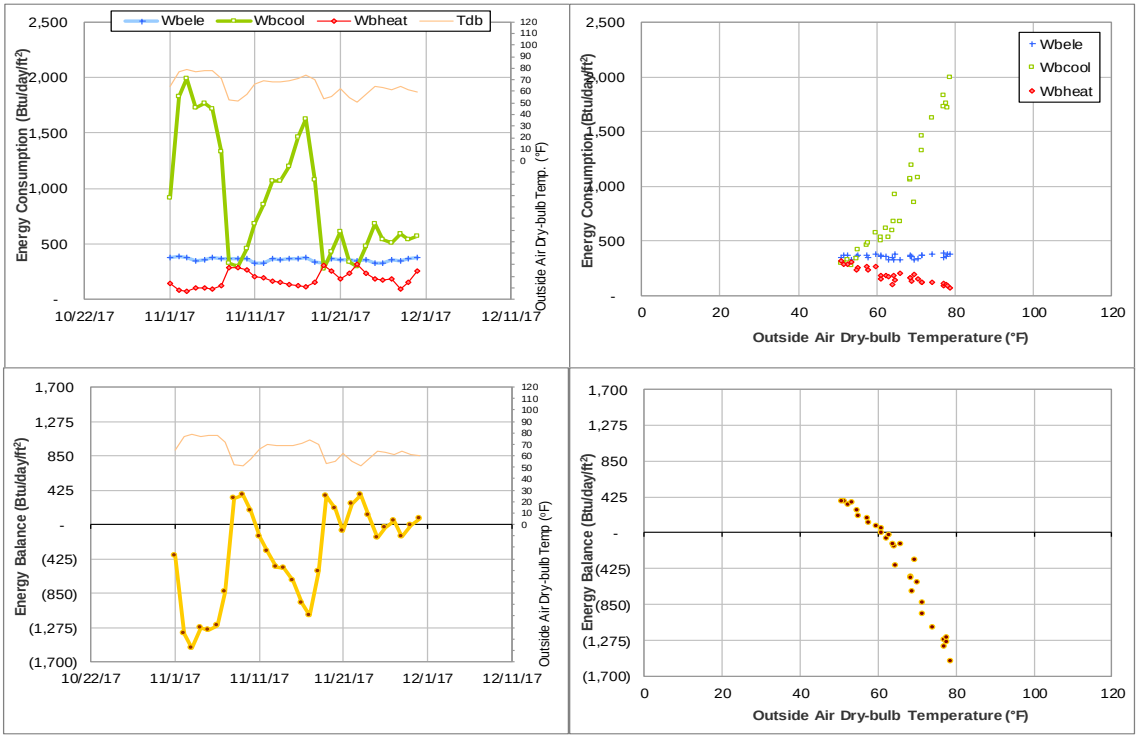


Figure IV-131 Laboratory Animal Care Building TAMU BLDG # 972 Energy Balance Plot during November 2017

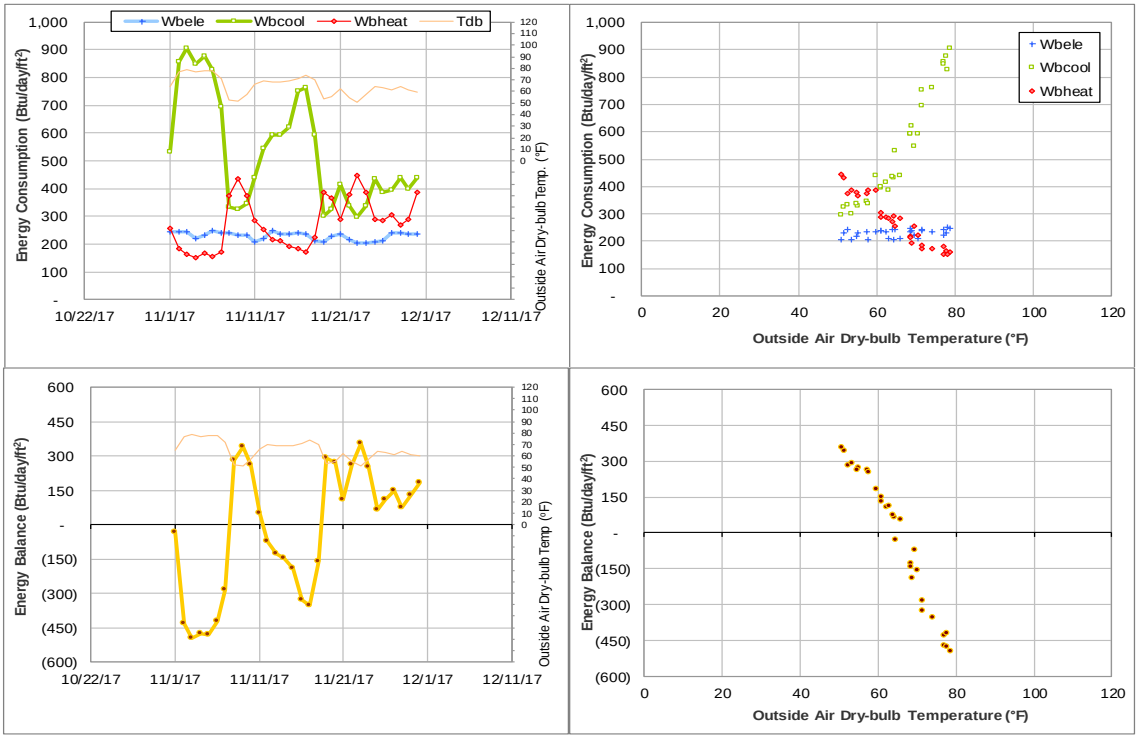


Figure IV-132 Vivarium III TAMU BLDG # 1020 Energy Balance Plot during November 2017

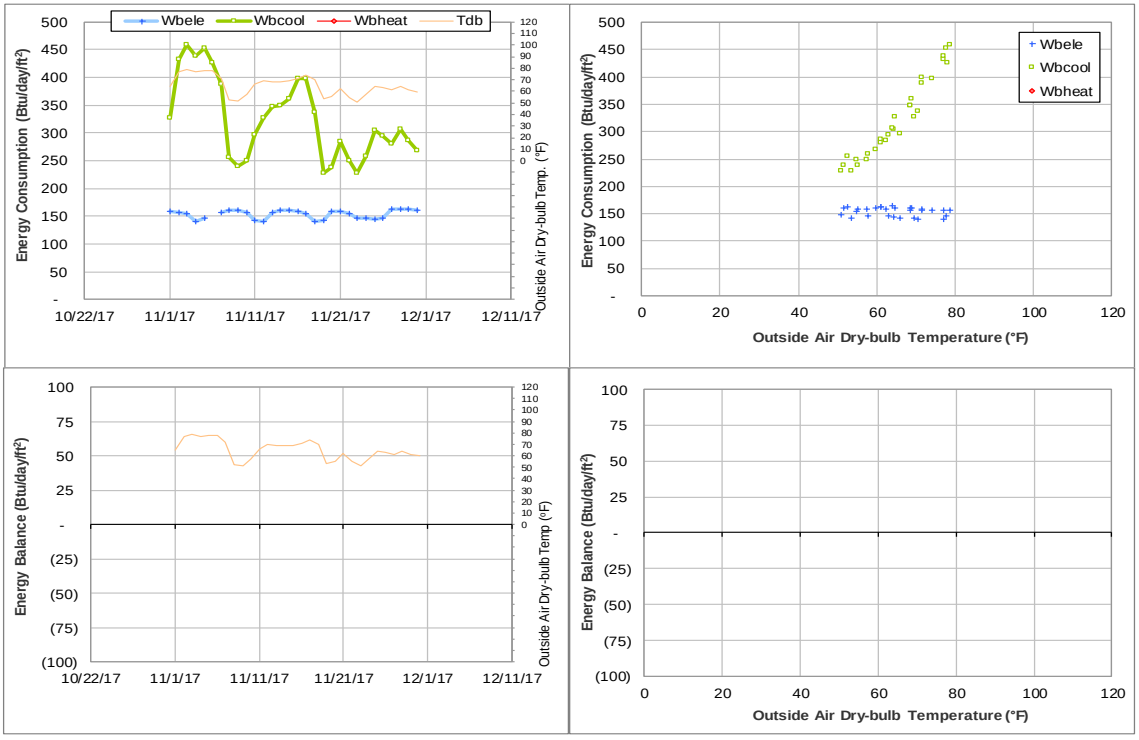


Figure IV-133 Veterinary Medicine Administration TAMU BLDG # 1026 Energy Balance Plot during November 2017

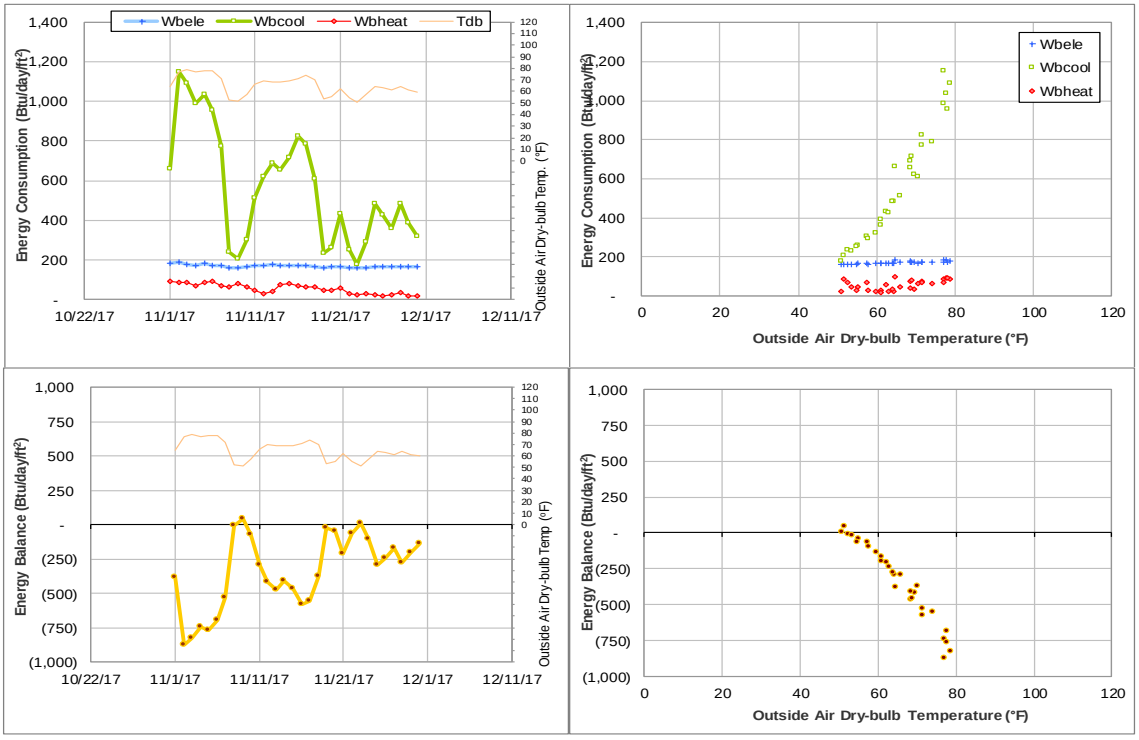


Figure IV-134 Texas Vet Med Diagnostic Lab TAMU BLDG # 1041 Energy Balance Plot during November 2017

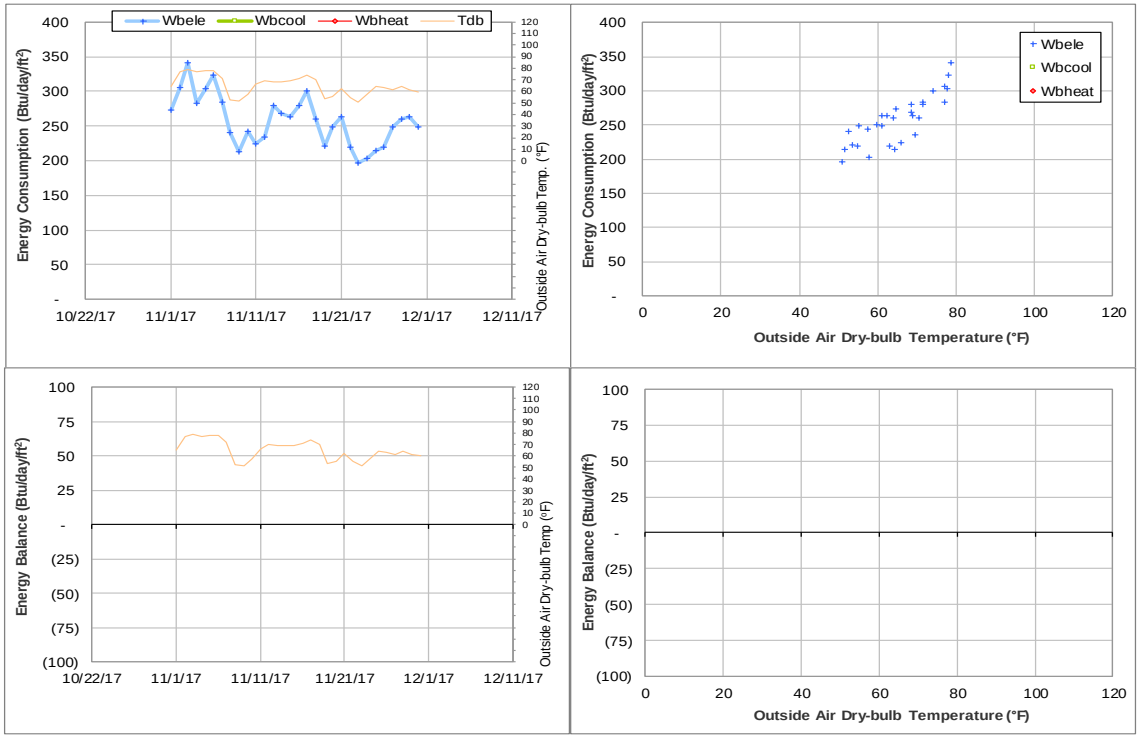


Figure IV-135 Forest Science Laboratory Building TAMU BLDG # 1042 Energy Balance Plot during November 2017

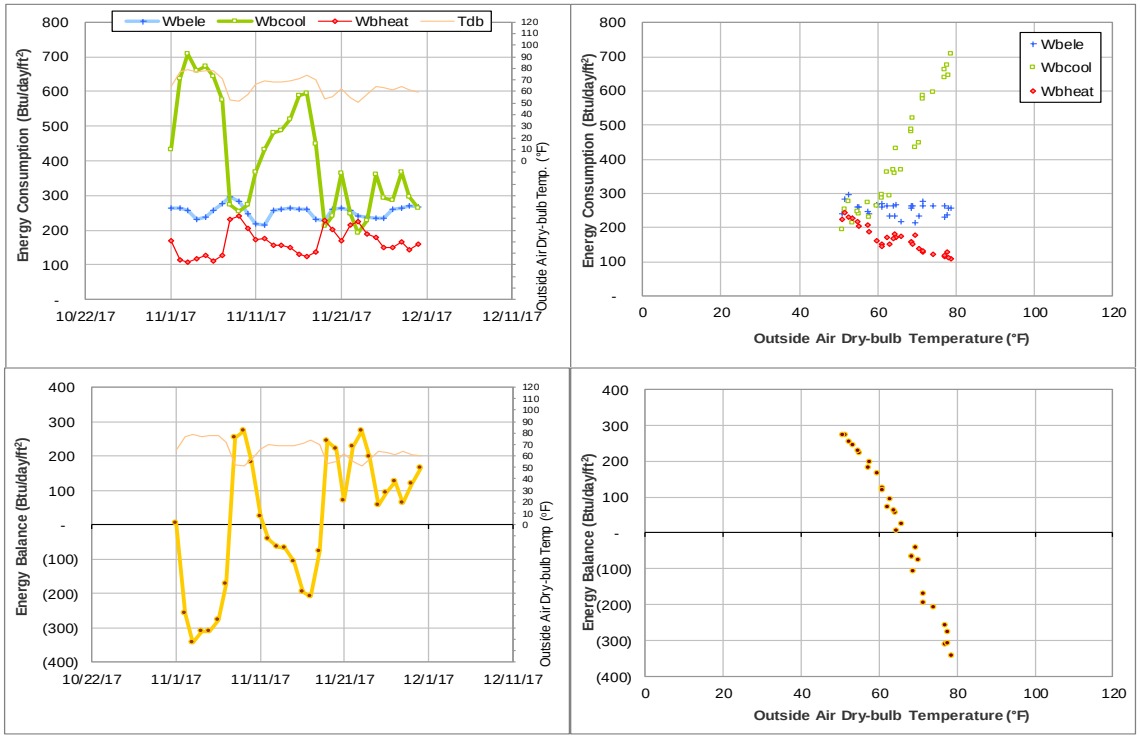


Figure IV-136 Veterinary Small Animal Hospital TAMU BLDG # 1085 Energy Balance Plot during November 2017

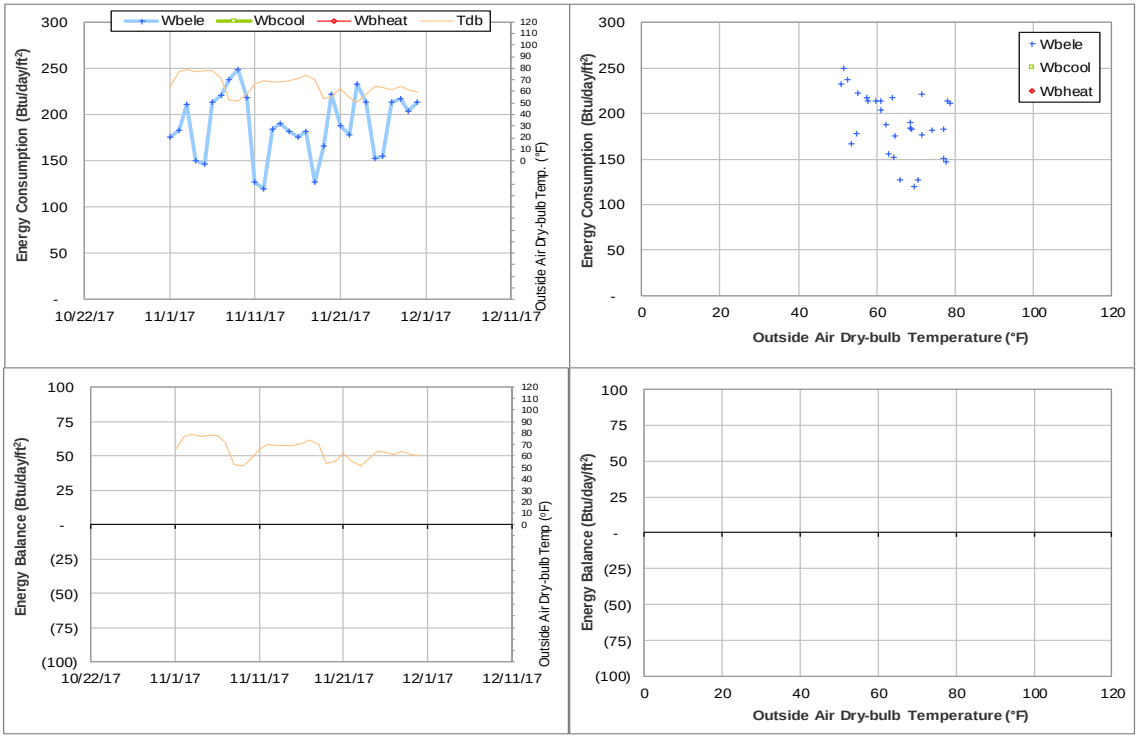


Figure IV-137 Utilities Energy Office Annex TAMU BLDG # 1089 Energy Balance Plot during November 2017

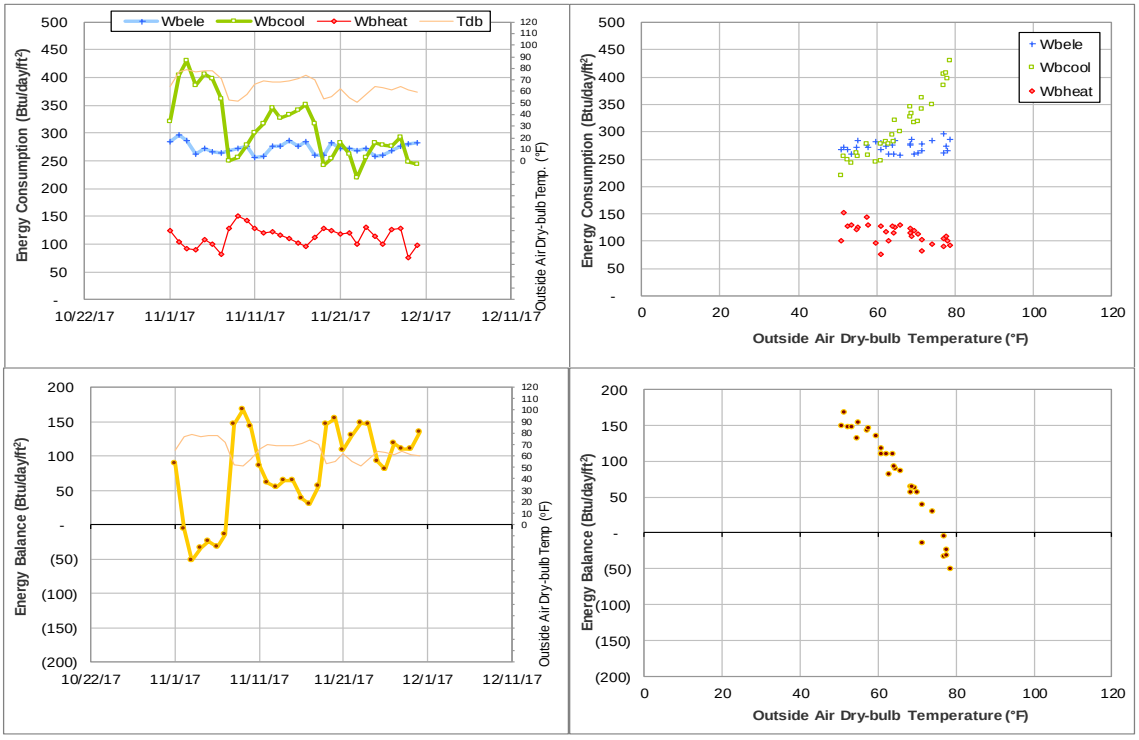


Figure IV-138 Biological Control Facility TAMU BLDG # 1146 Energy Balance Plot during November 2017

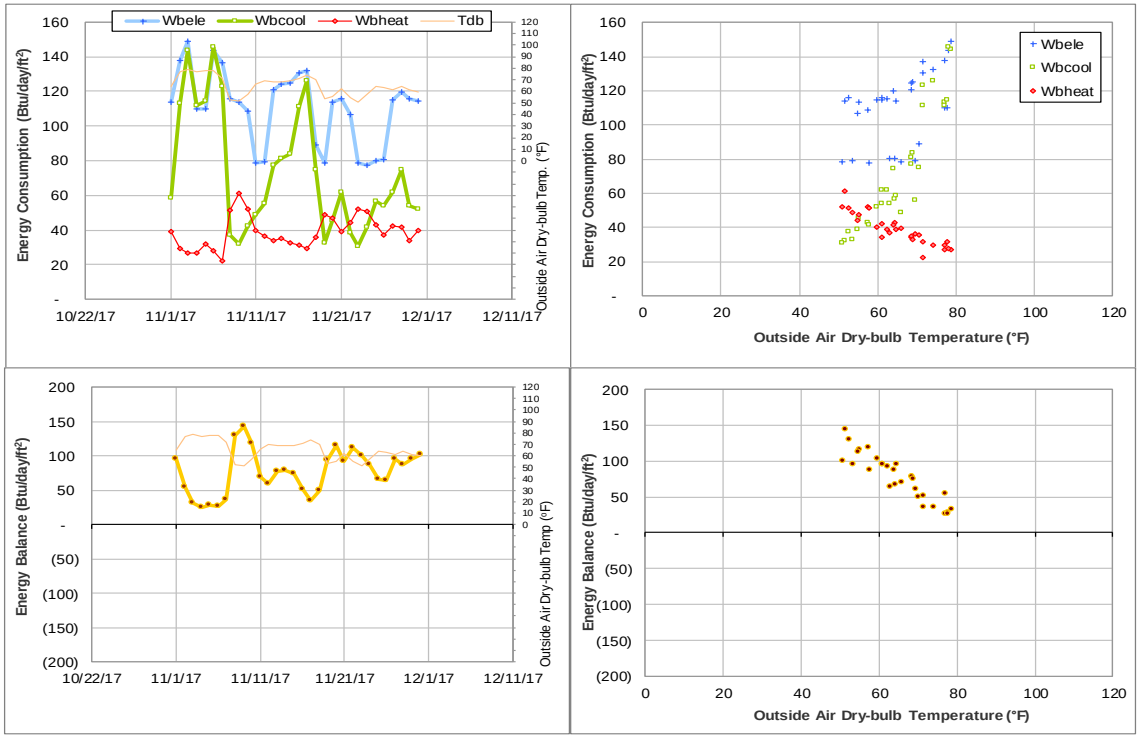


Figure IV-139 Physical Plant Administration & Shops TAMU BLDG # 1156 Energy Balance Plot during November 2017

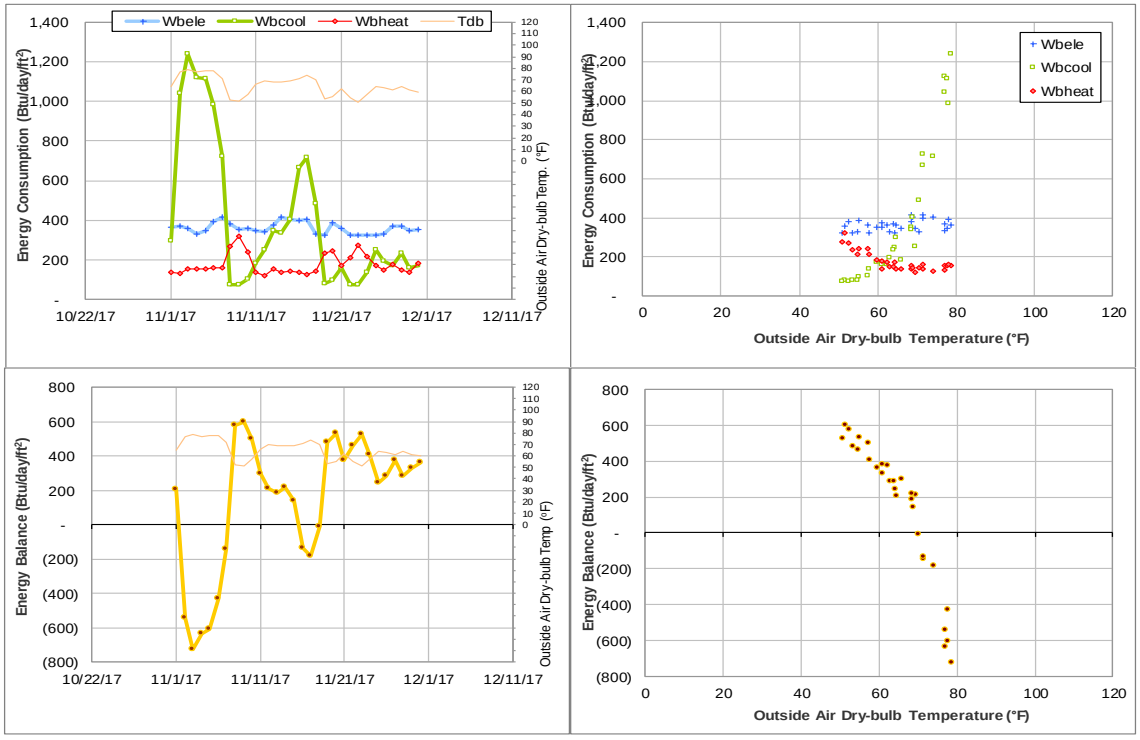


Figure IV-140 Veterinary Anatomic Pathology TAMU BLDG # 1184 Energy Balance Plot during November 2017

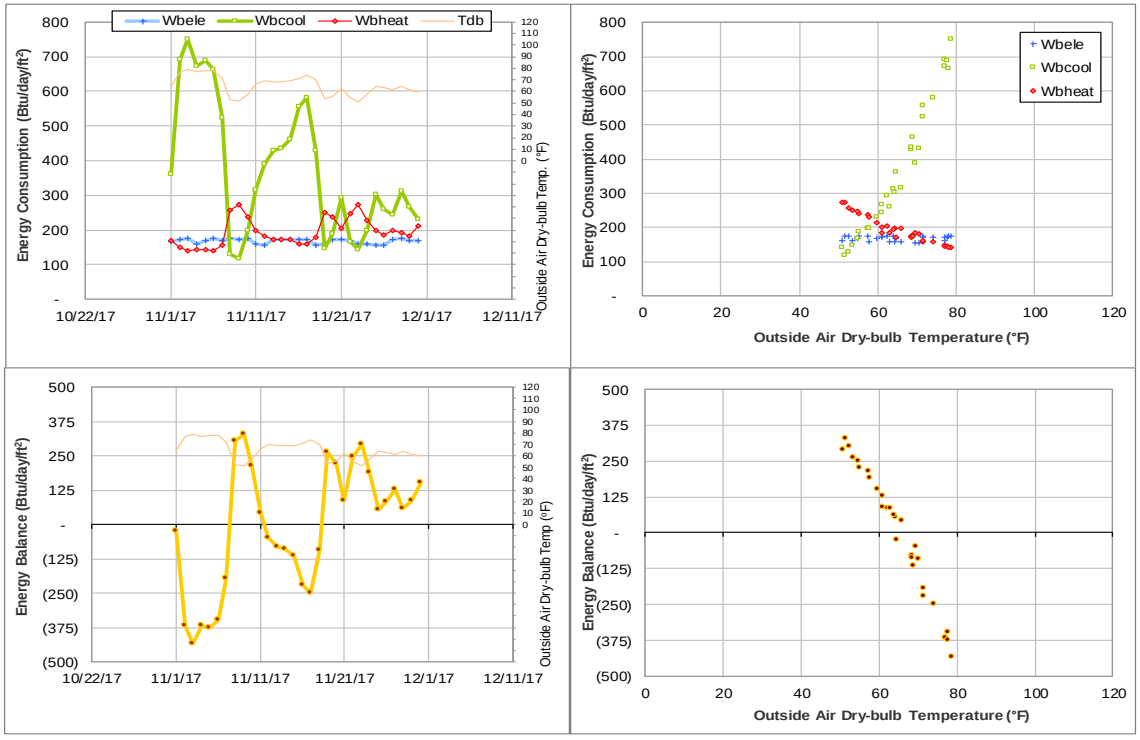


Figure IV-141 Veterinary Large Animal Hospital TAMU BLDG # 1194 Energy Balance Plot during November 2017

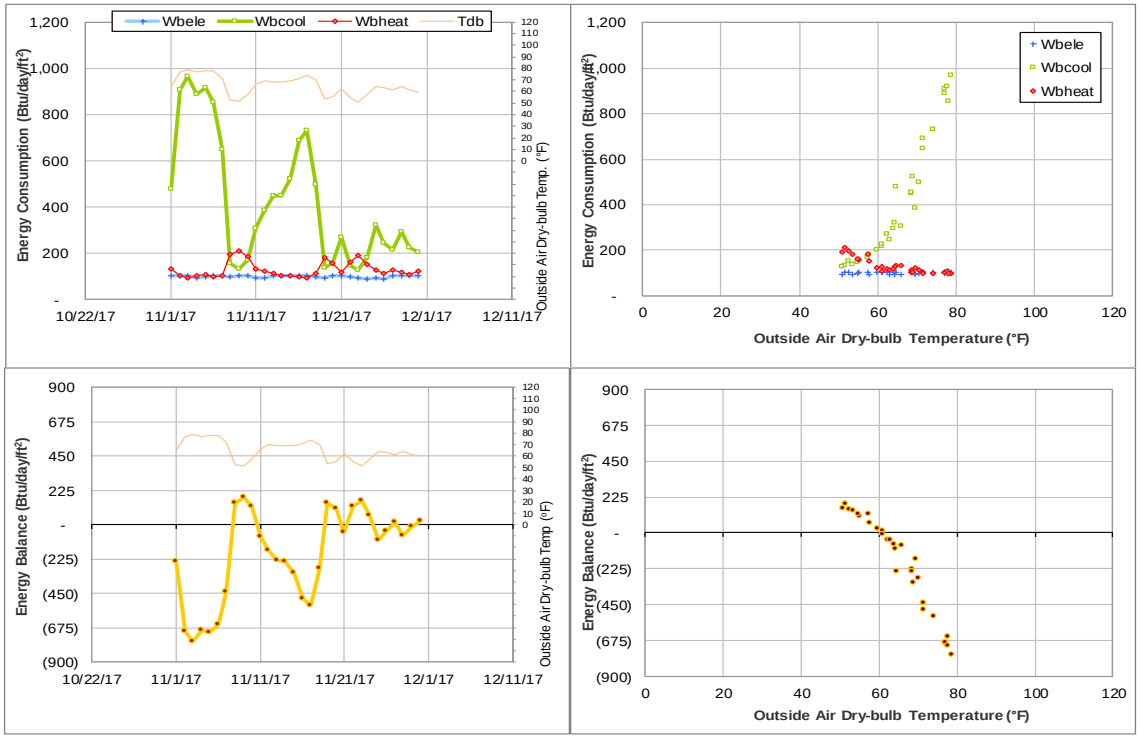


Figure IV-142 Veterinary Research Building TAMU BLDG # 1197 Energy Balance Plot during November 2017

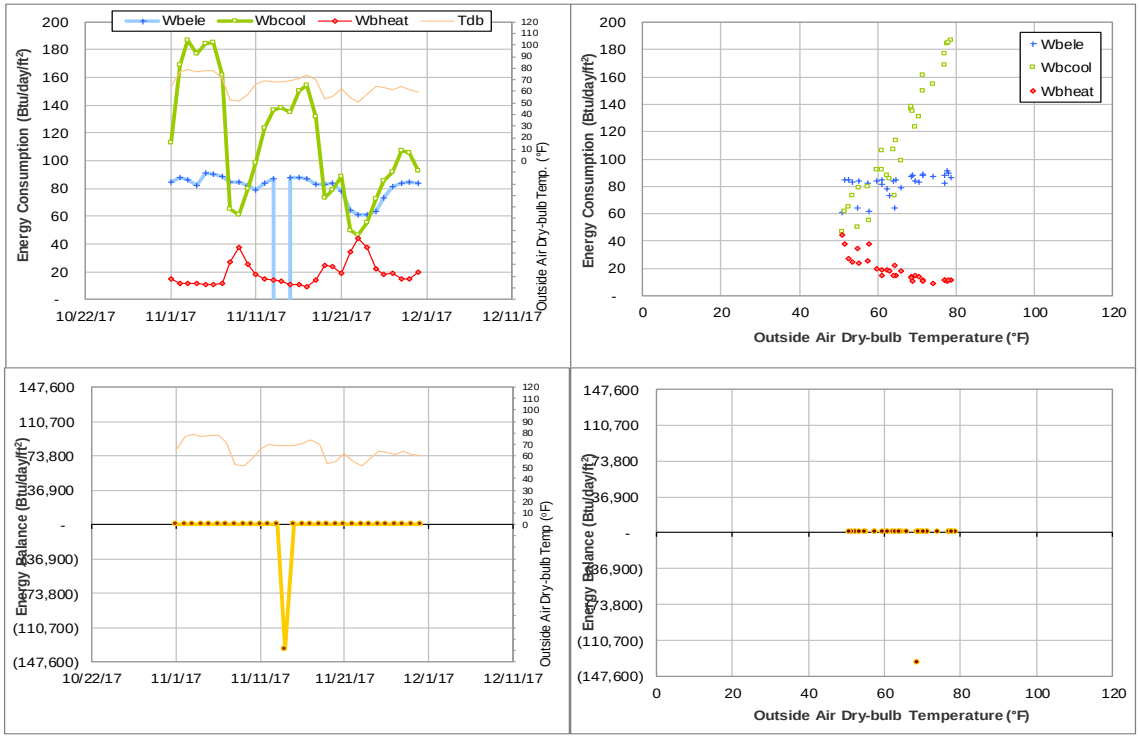


Figure IV-143 Hullabaloo Residence Hall TAMU BLDG # 1416 Energy Balance Plot during November 2017

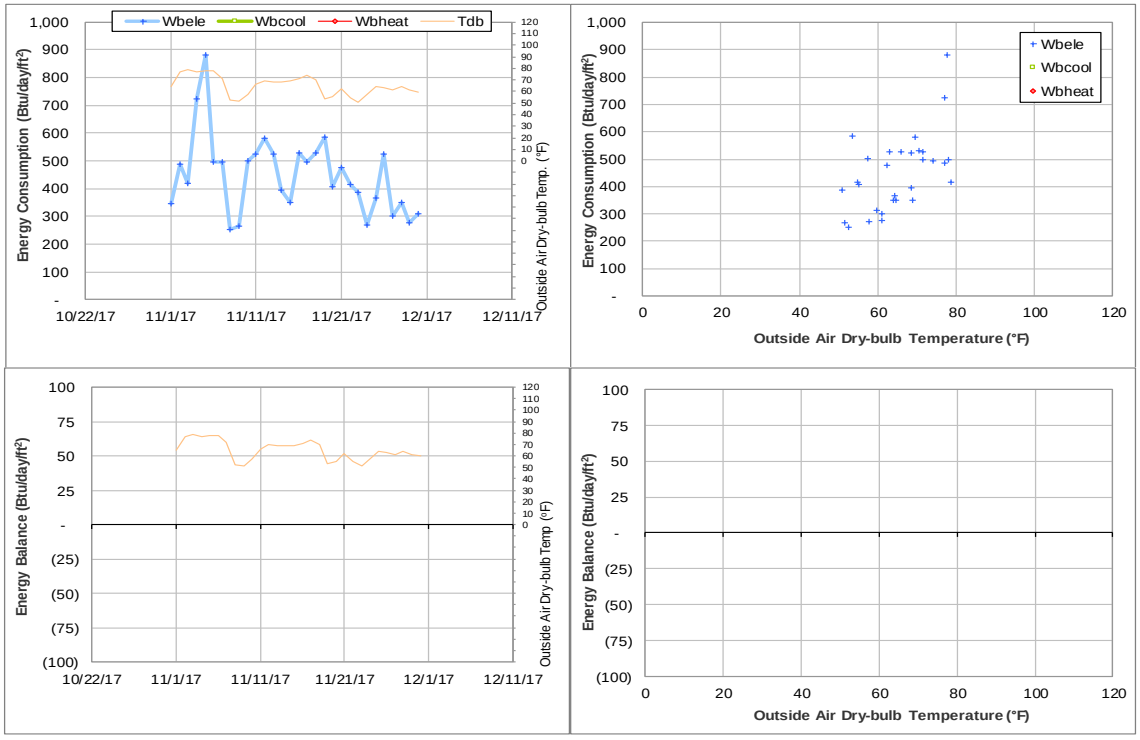


Figure IV-144 University Apartments - Laundry at the Gardens TAMU BLDG # 1450 Energy Balance Plot during November 2017

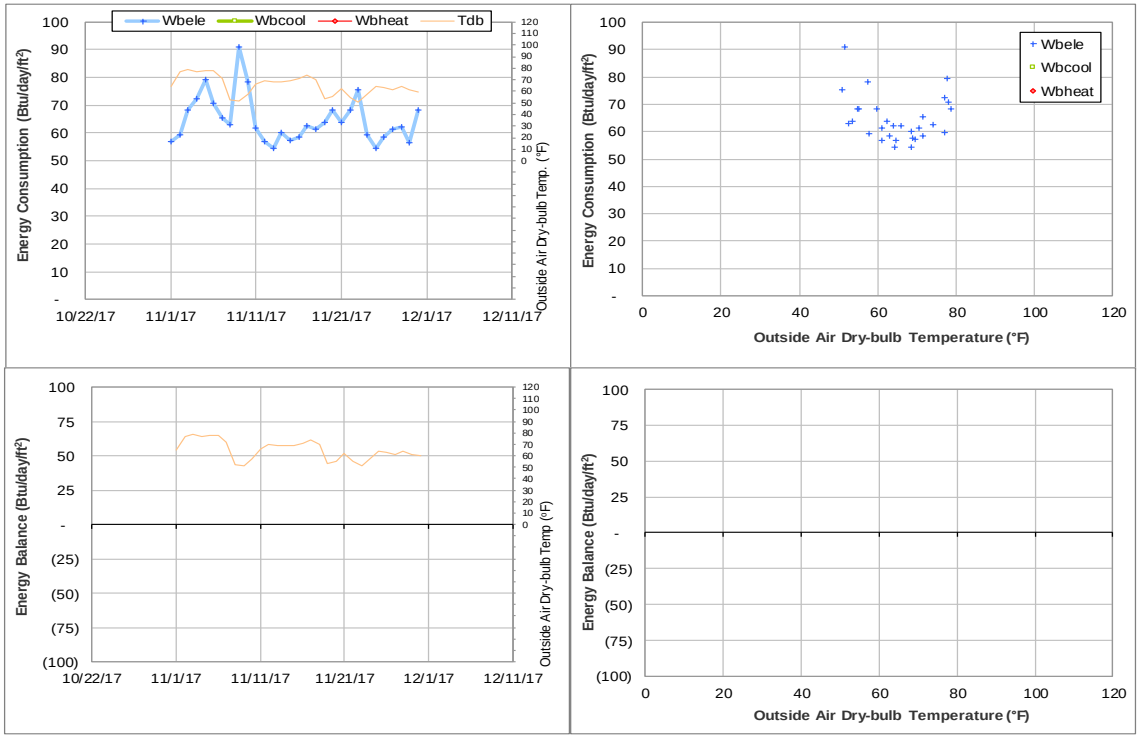


Figure IV-145 University Apartments - The Gardens J TAMU BLDG # 1451 Energy Balance Plot during November 2017

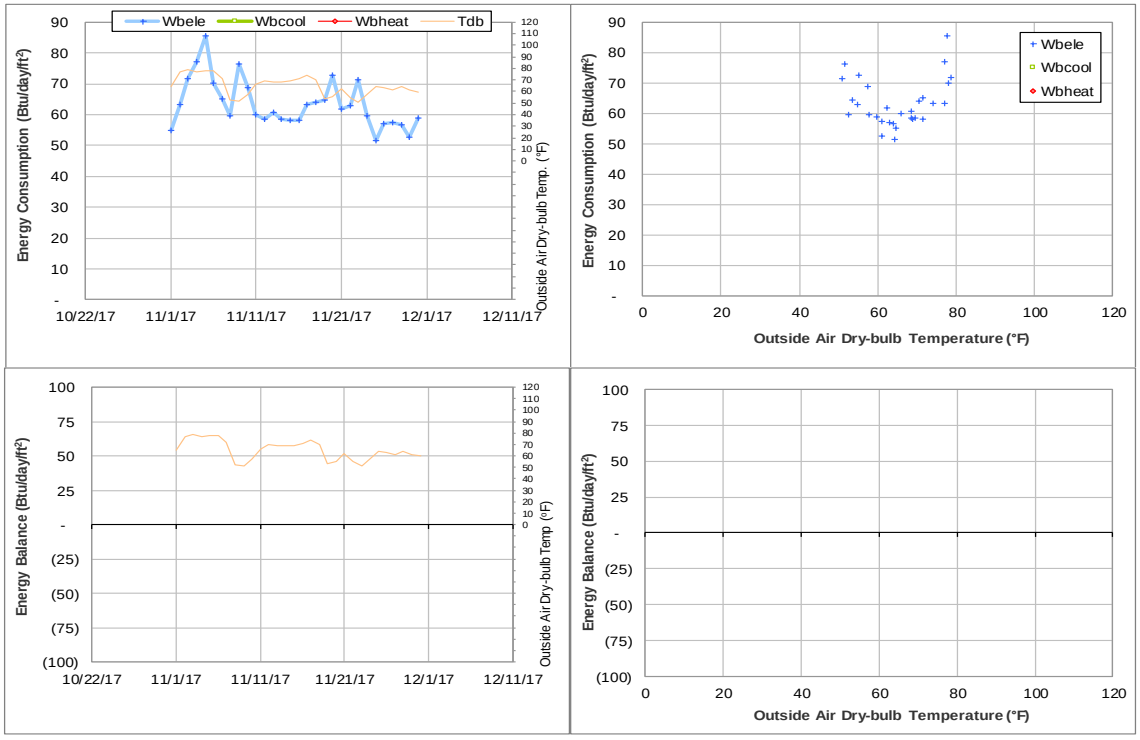


Figure IV-146 University Apartments - The Gardens K TAMU BLDG # 1452 Energy Balance Plot during November 2017

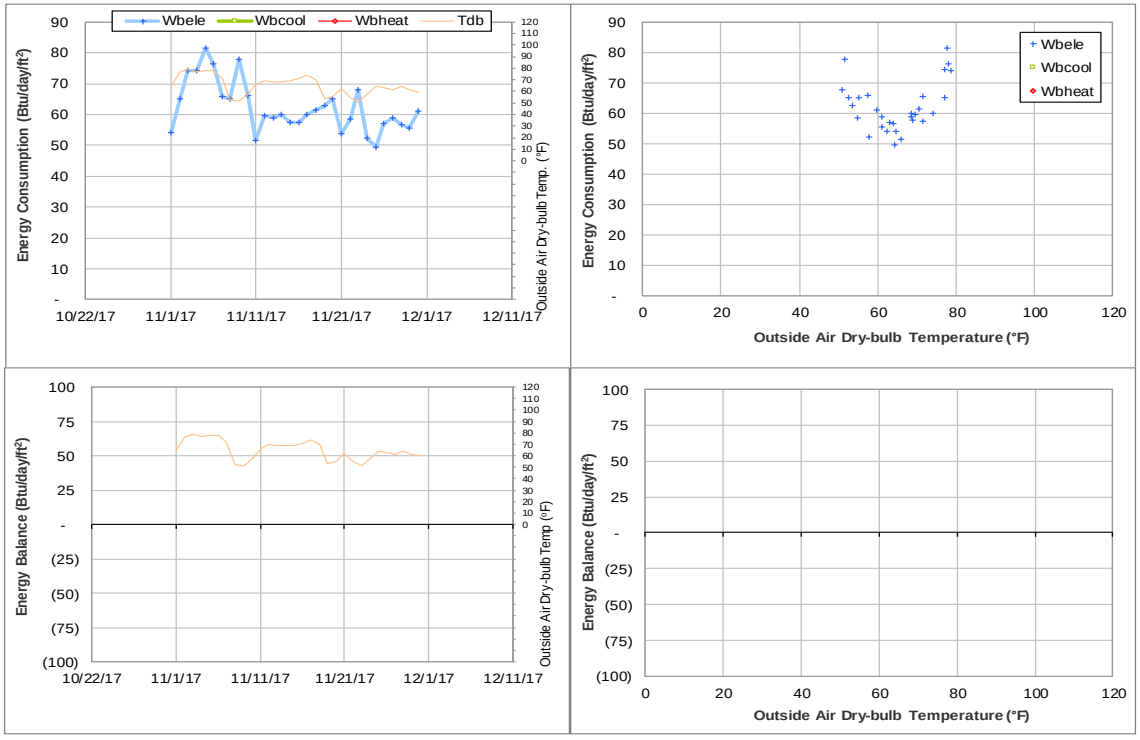


Figure IV-147 University Apartments - The Gardens L TAMU BLDG # 1453 Energy Balance Plot during November 2017

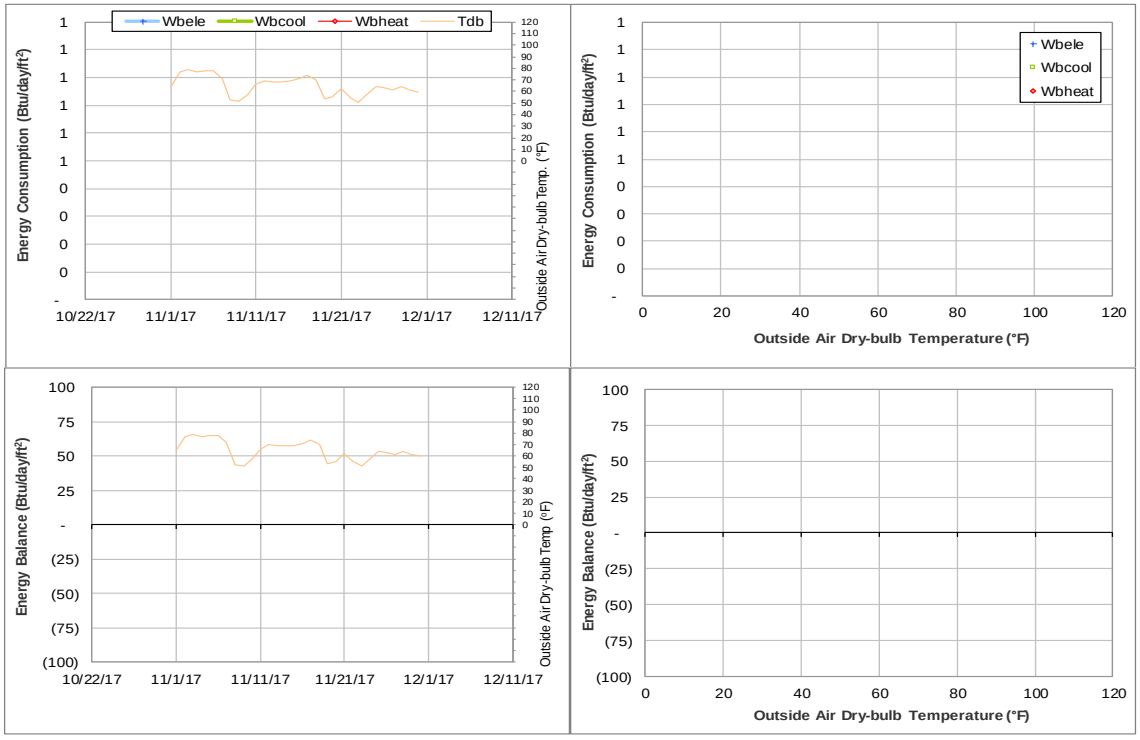


Figure IV-148 University Apartments - The Gardens F TAMU BLDG # 1454 Energy Balance Plot during November 2017

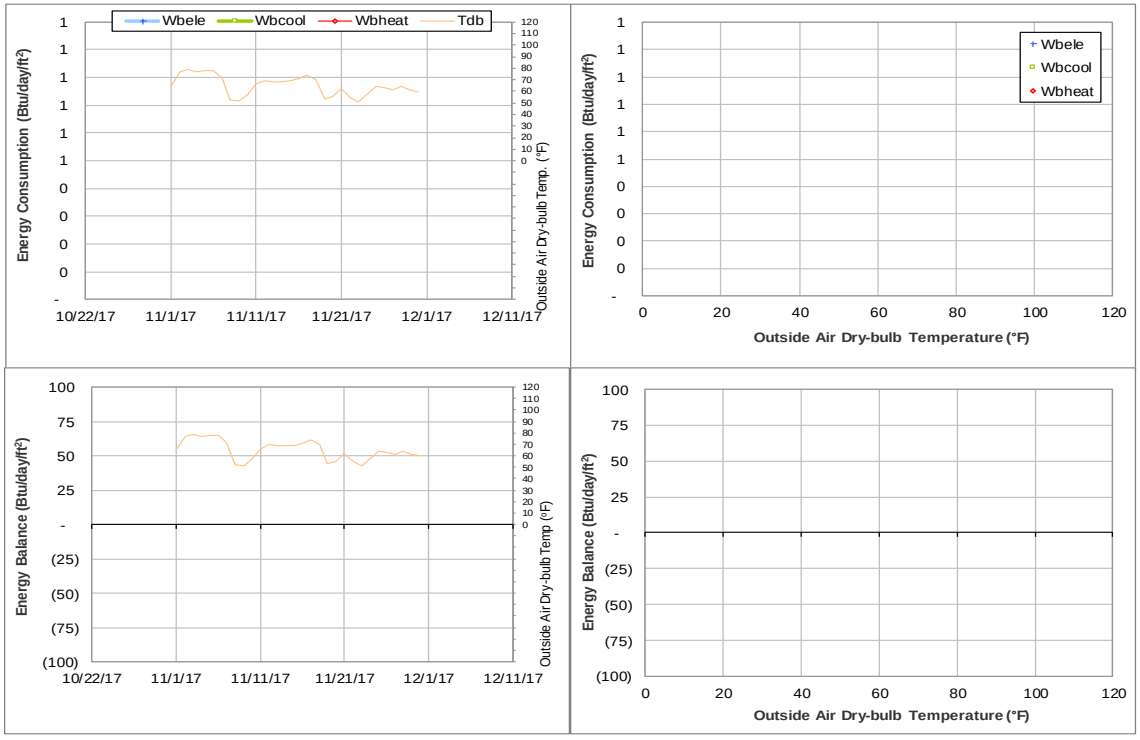


Figure IV-149 University Apartments - The Gardens G TAMU BLDG # 1455 Energy Balance Plot during November 2017

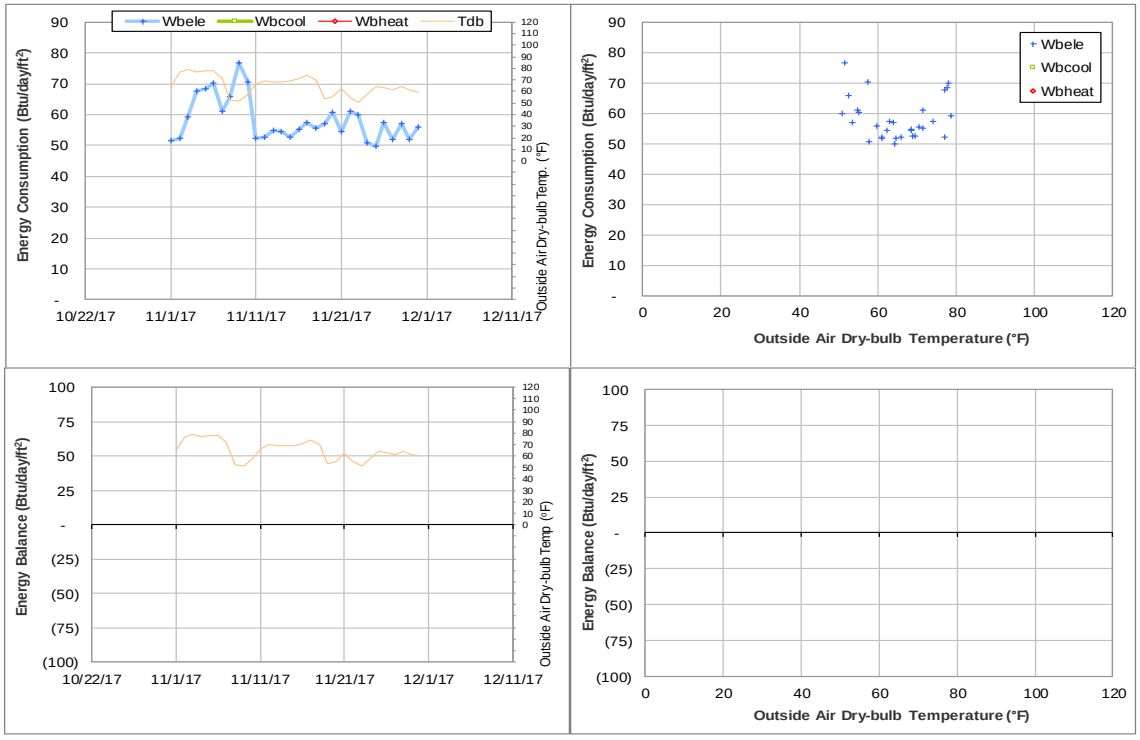


Figure IV-150 University Apartments - The Gardens H TAMU BLDG # 1456 Energy Balance Plot during November 2017

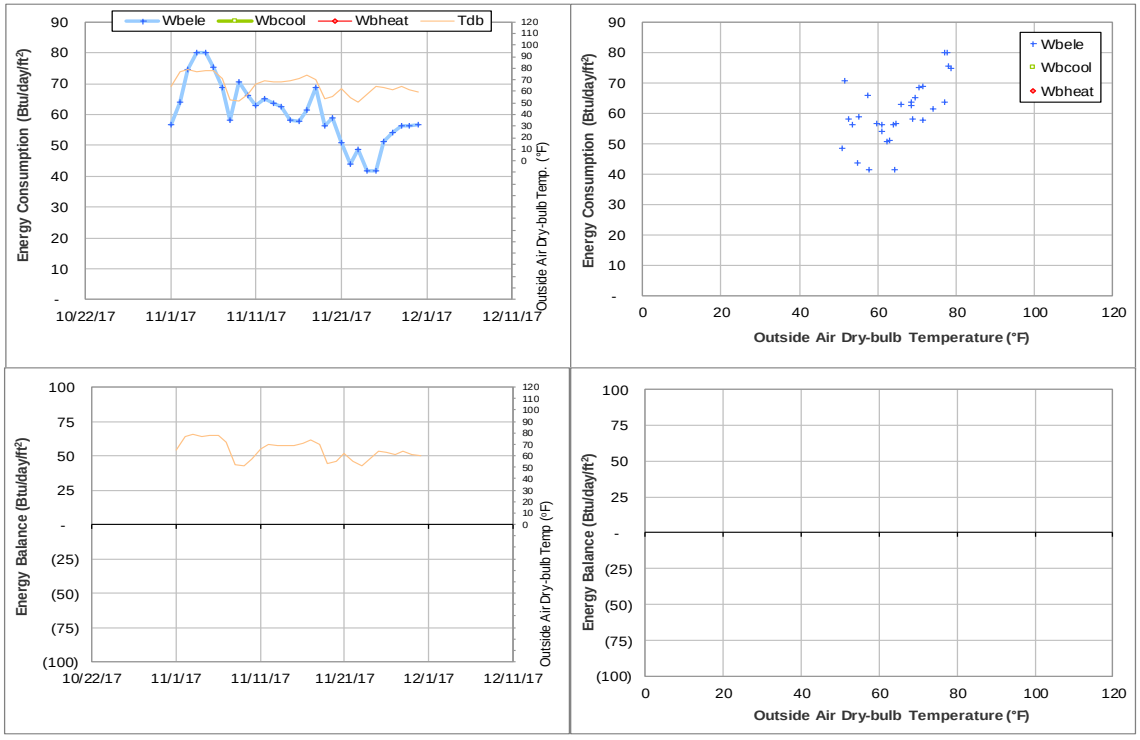


Figure IV-151 University Apartments - The Gardens M TAMU BLDG # 1457 Energy Balance Plot during November 2017

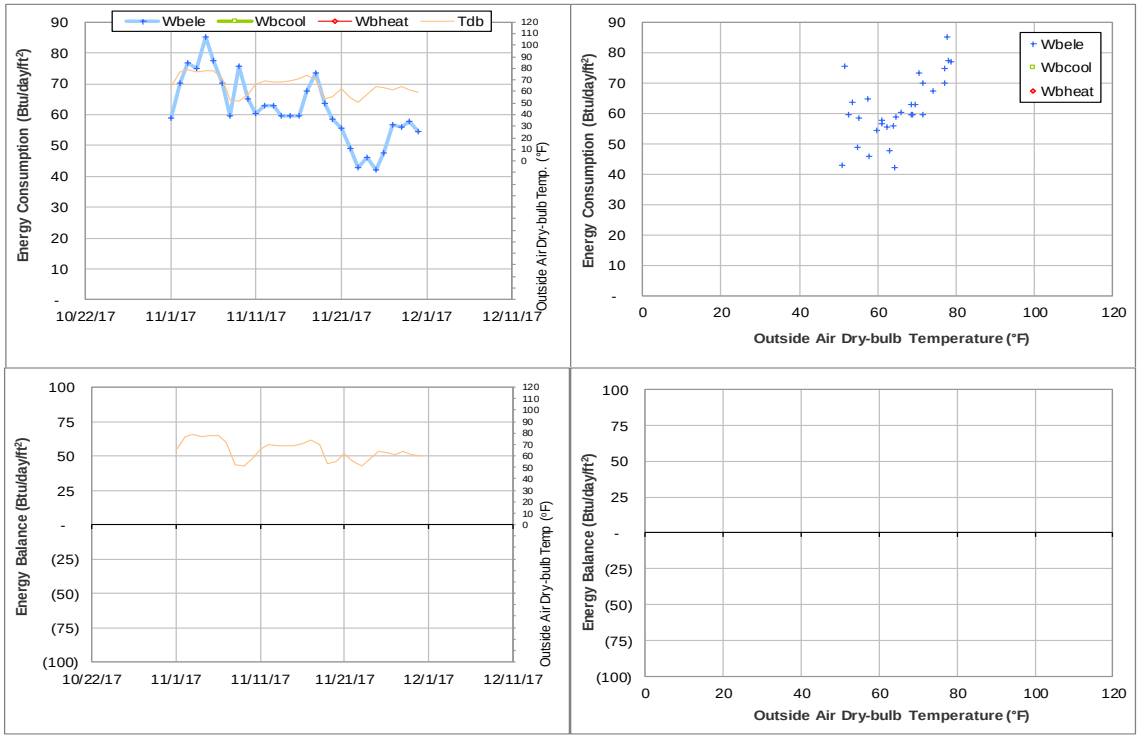


Figure IV-152 University Apartments - The Gardens N TAMU BLDG # 1458 Energy Balance Plot during November 2017

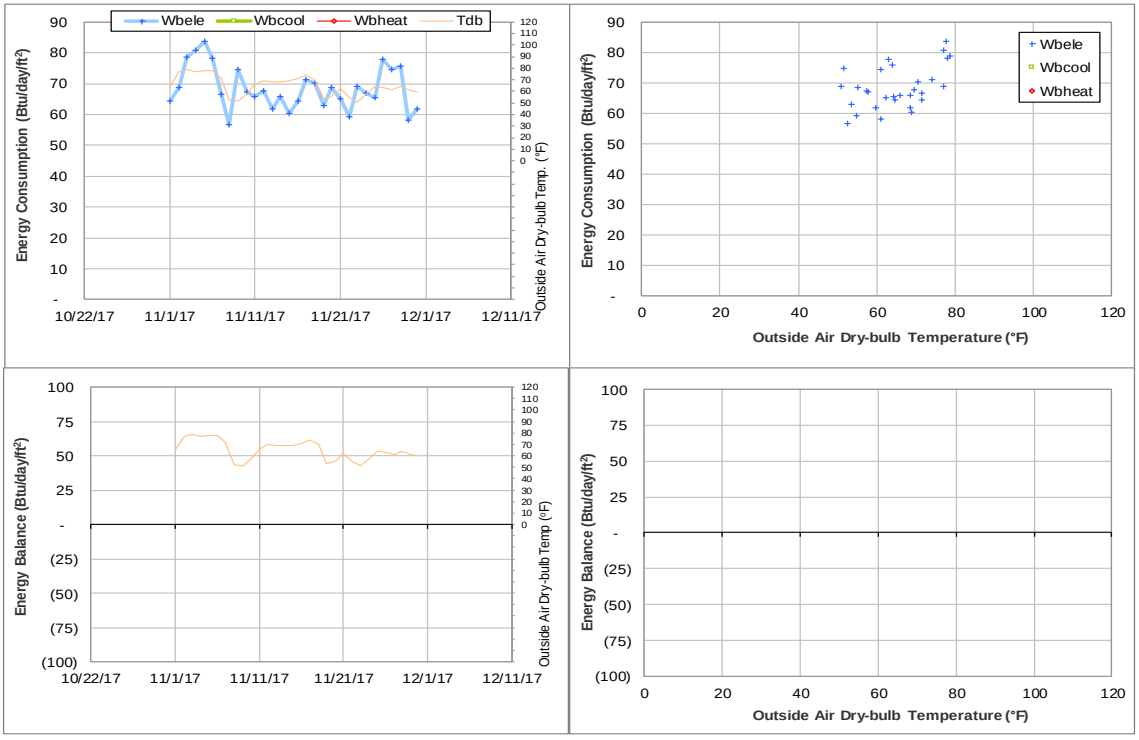


Figure IV-153 University Apartments - The Gardens P TAMU BLDG # 1459 Energy Balance Plot during November 2017

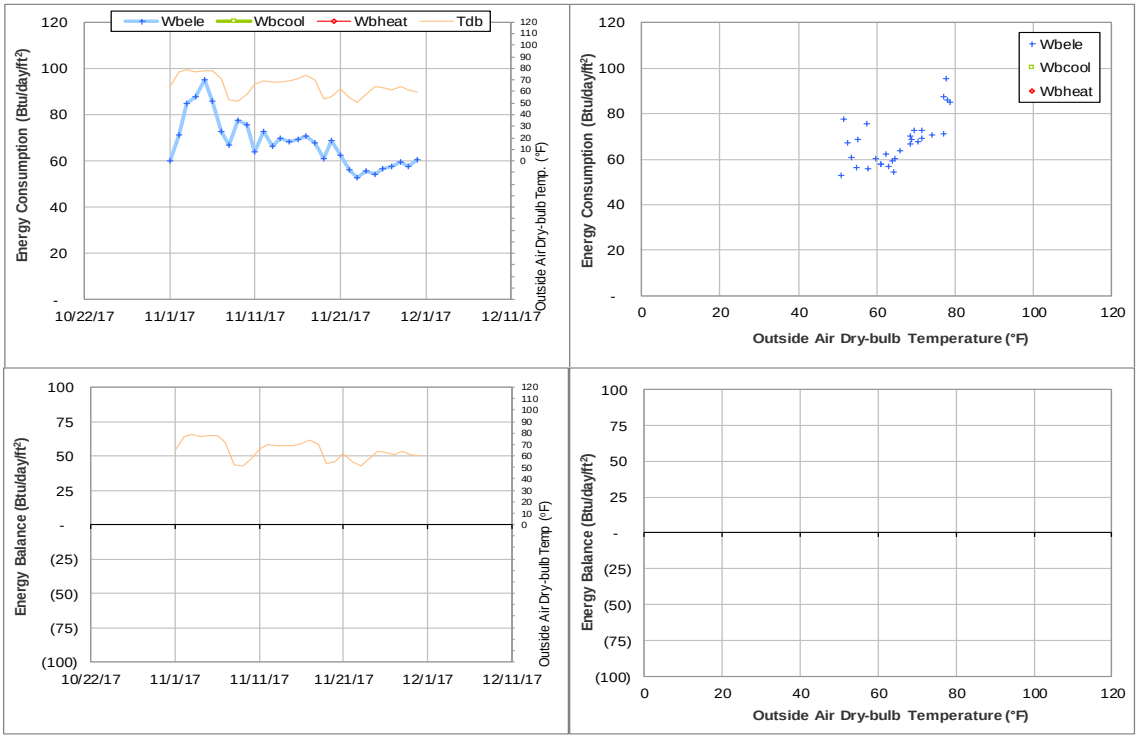


Figure IV-154 University Apartments - The Gardens Q TAMU BLDG # 1460 Energy Balance Plot during November 2017

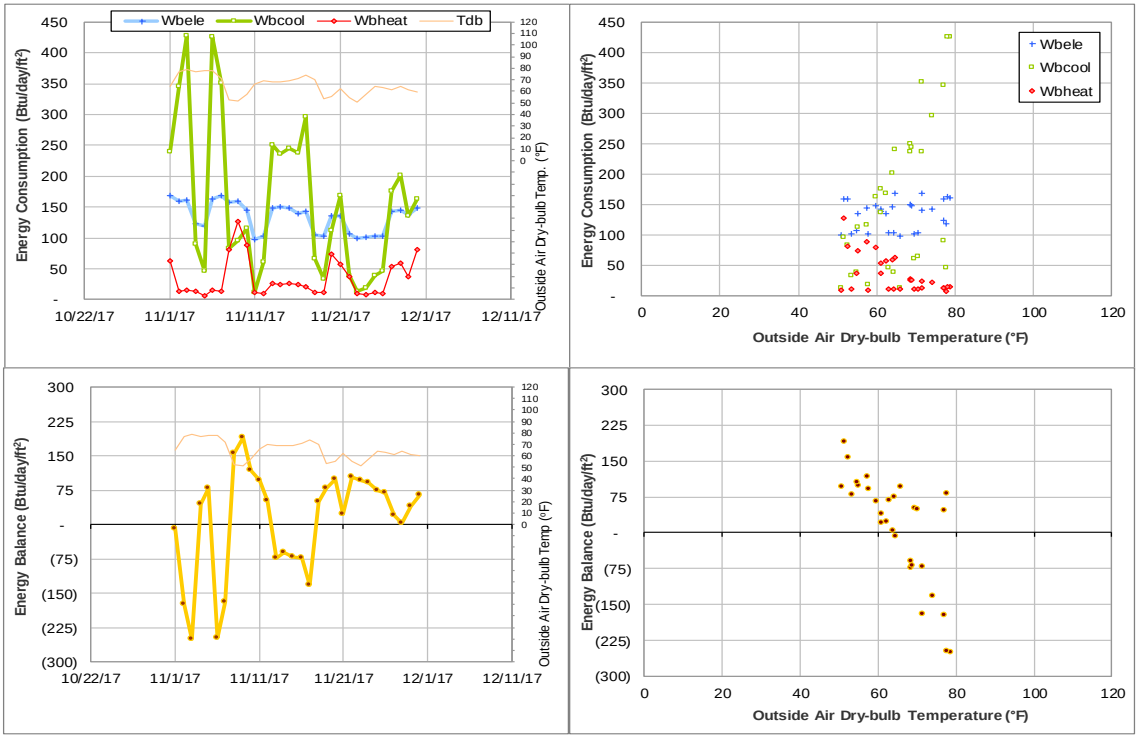


Figure IV-155 Utilities & Energy Services Business Office TAMU BLDG # 1497 Energy Balance Plot during November 2017

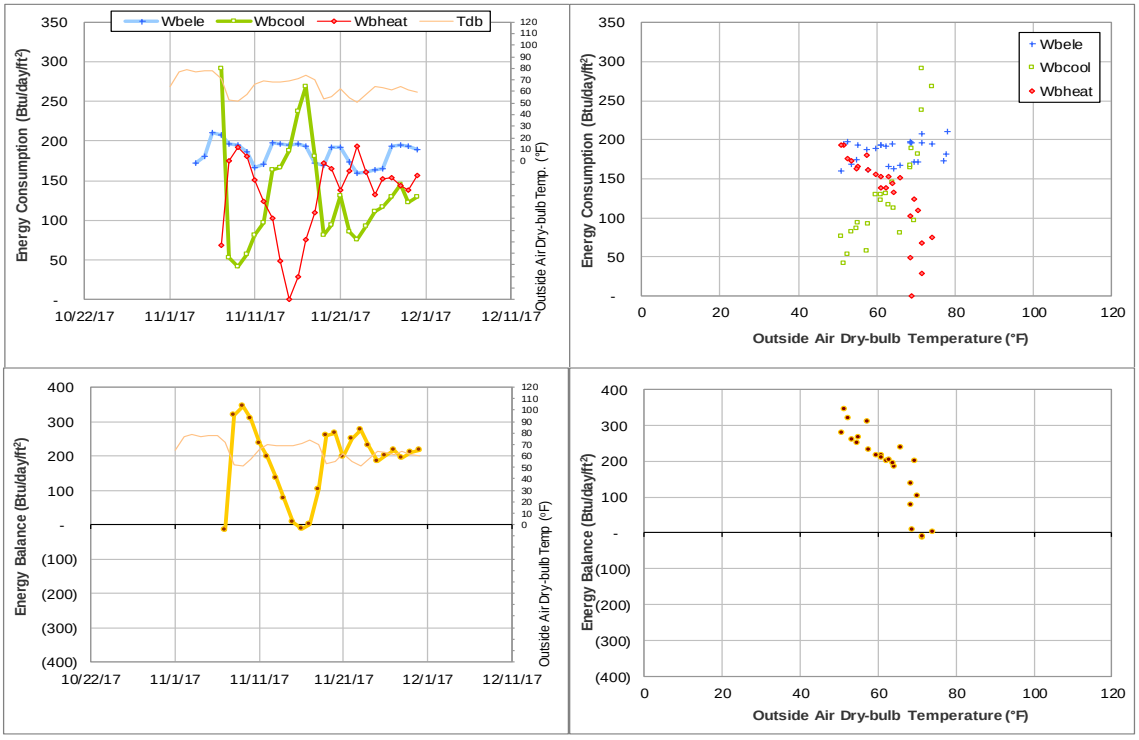


Figure IV-156 Kleberg Center TAMU BLDG # 1501 Energy Balance Plot during November 2017

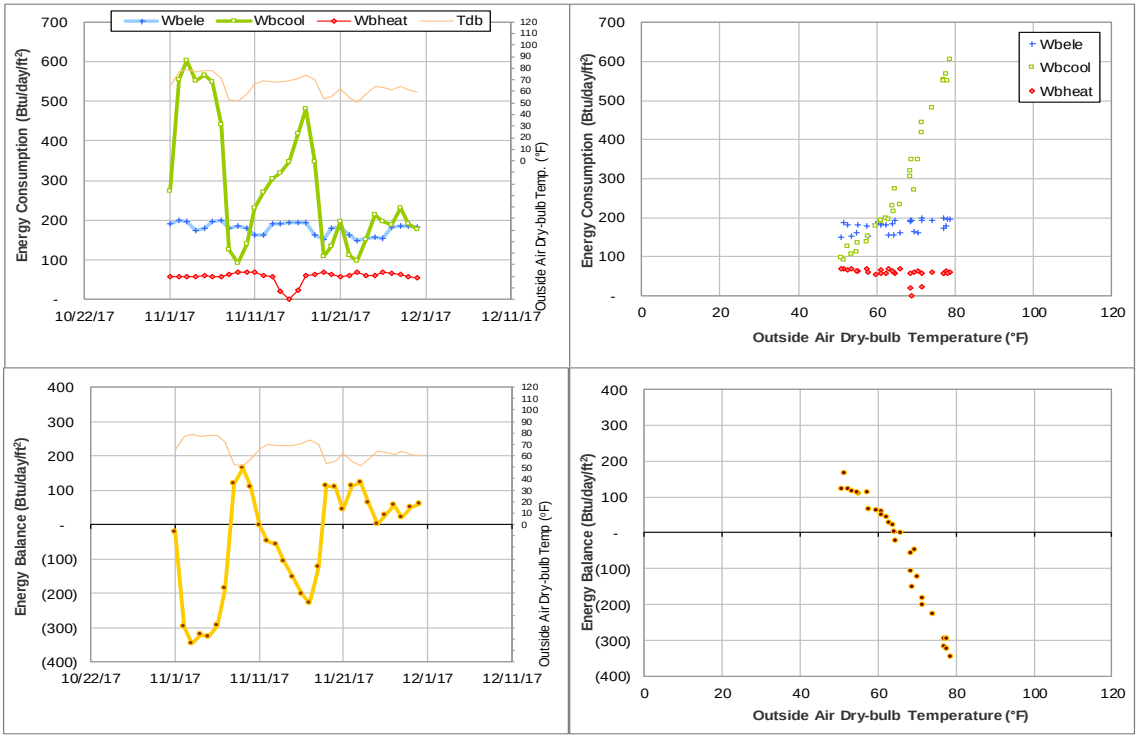


Figure IV-157 Heep Center TAMU BLDG # 1502 Energy Balance Plot during November 2017

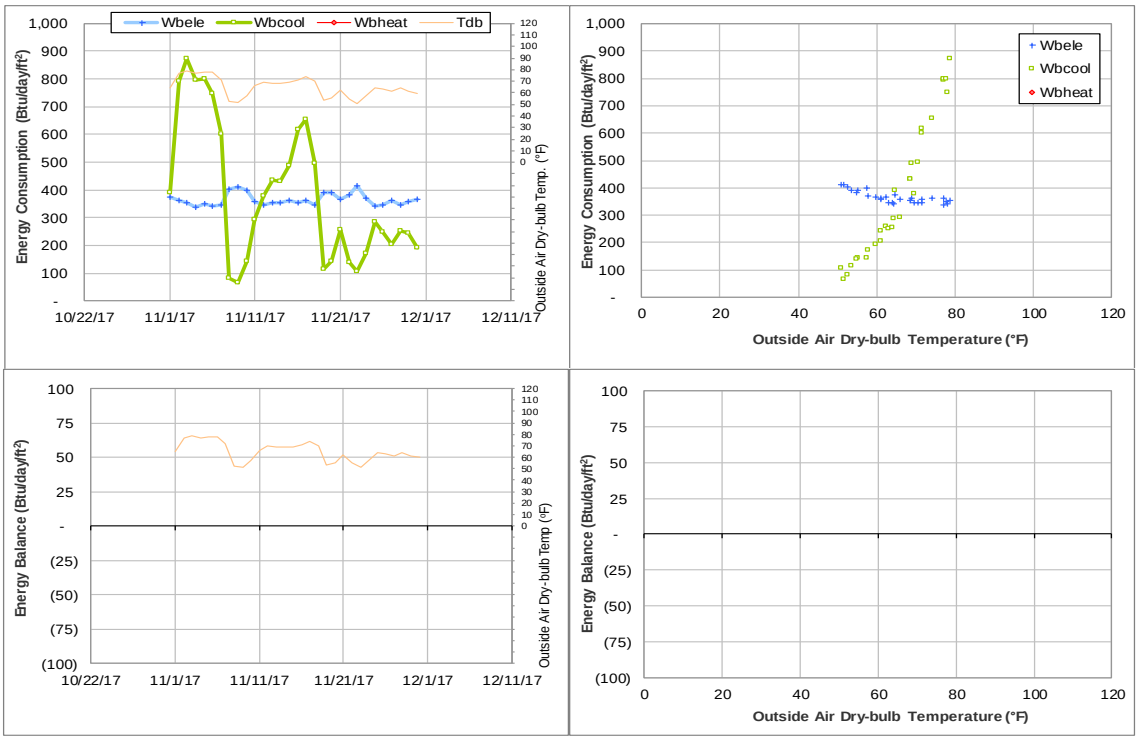


Figure IV-158 Cater-Mattil Hall TAMU BLDG # 1503 Energy Balance Plot during November 2017

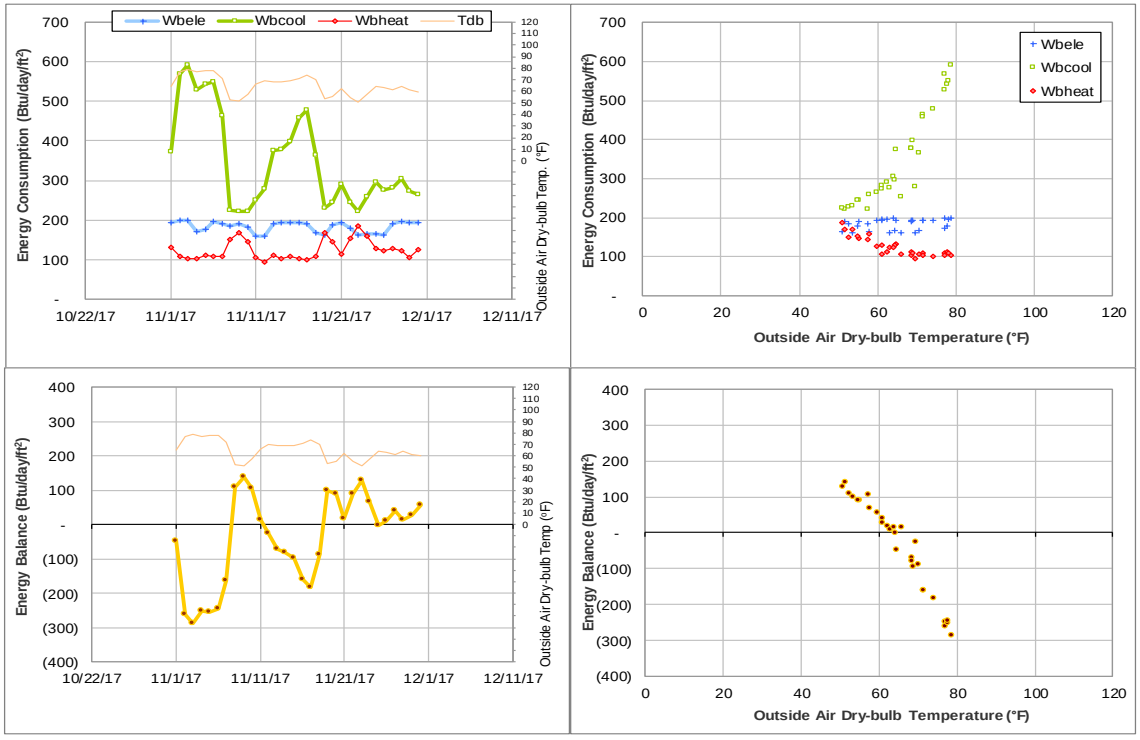


Figure IV-159 Reynolds Medical Sciences Building TAMU BLDG # 1504 Energy Balance Plot during November 2017

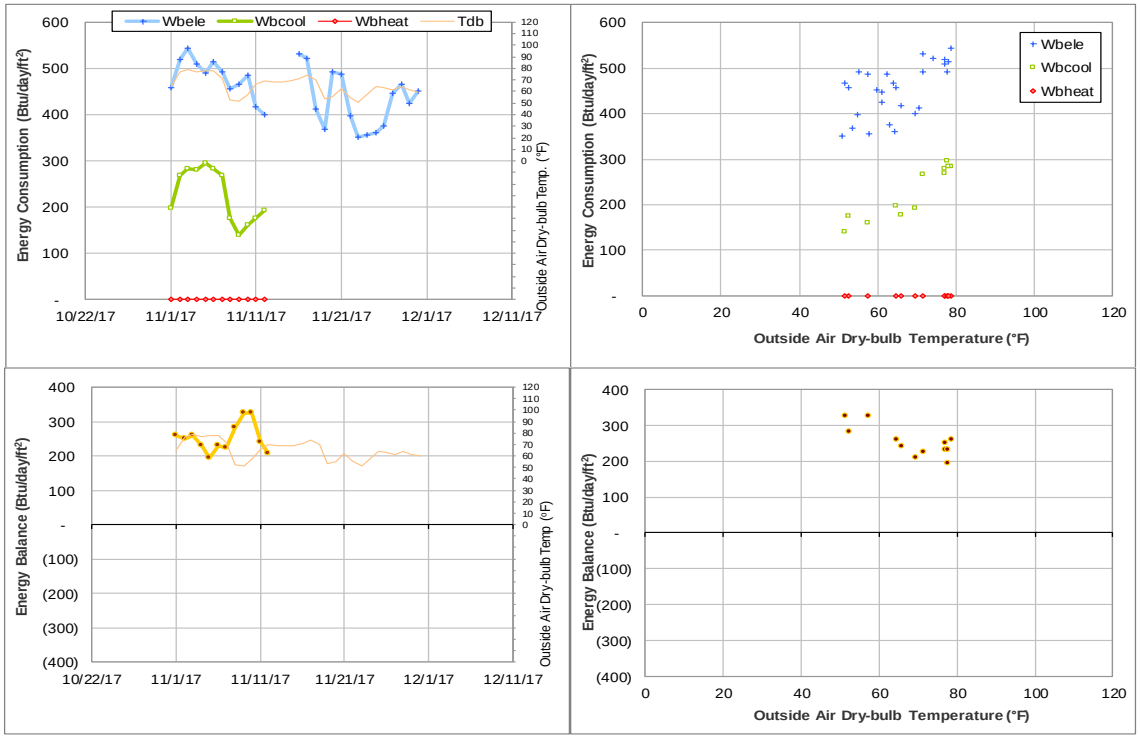


Figure IV-160 Rosenthal Meat Science & Technology Center TAMU BLDG # 1505 Energy Balance Plot during November 2017

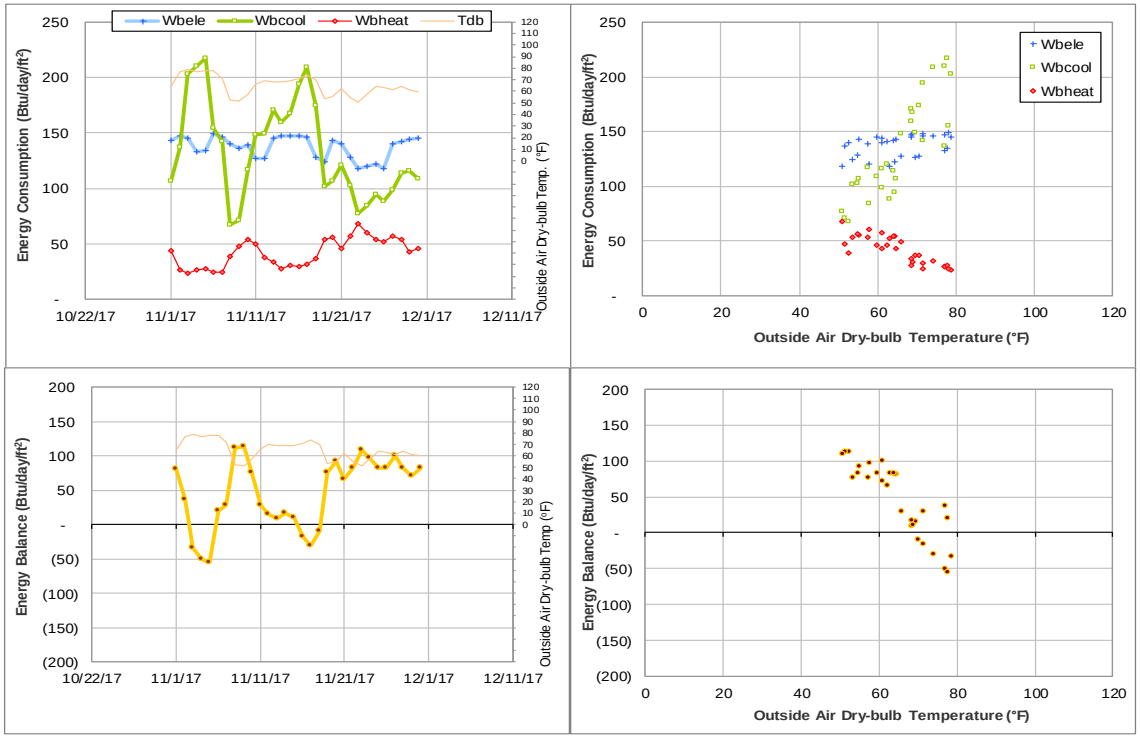


Figure IV-161 Horticulture-Forest Science Building TAMU BLDG # 1506 Energy Balance Plot during November 2017

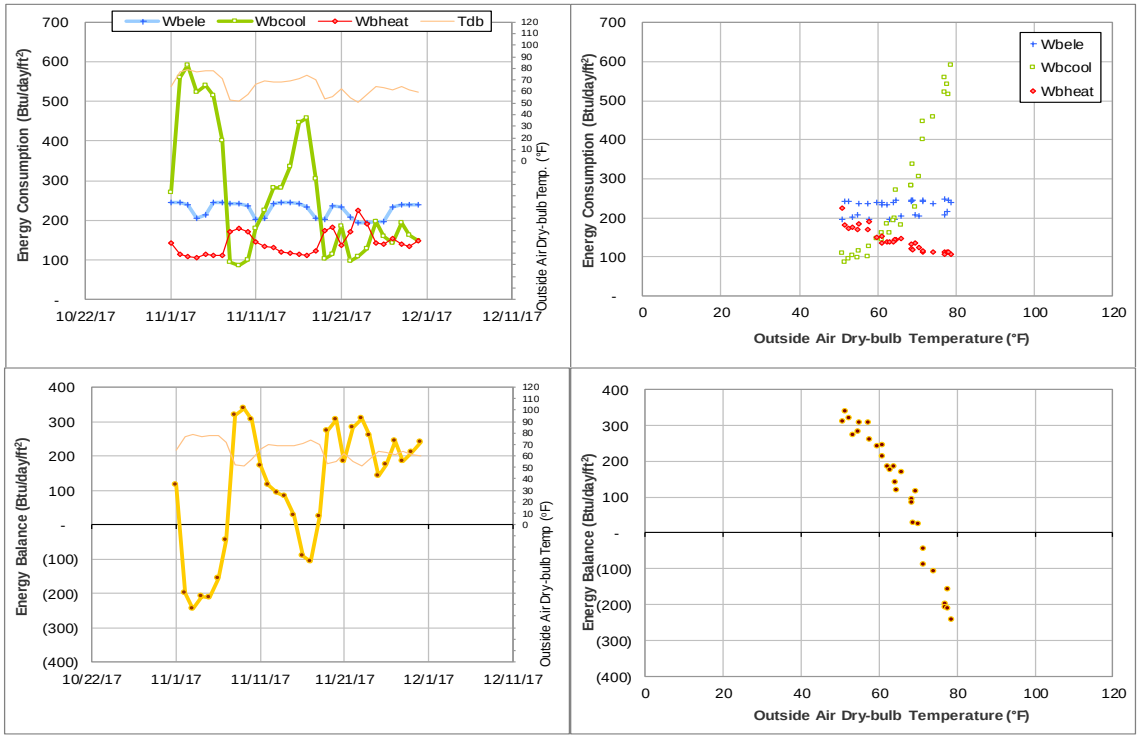


Figure IV-162 Biochemistry-Biophysics Building TAMU BLDG # 1507 Energy Balance Plot during November 2017

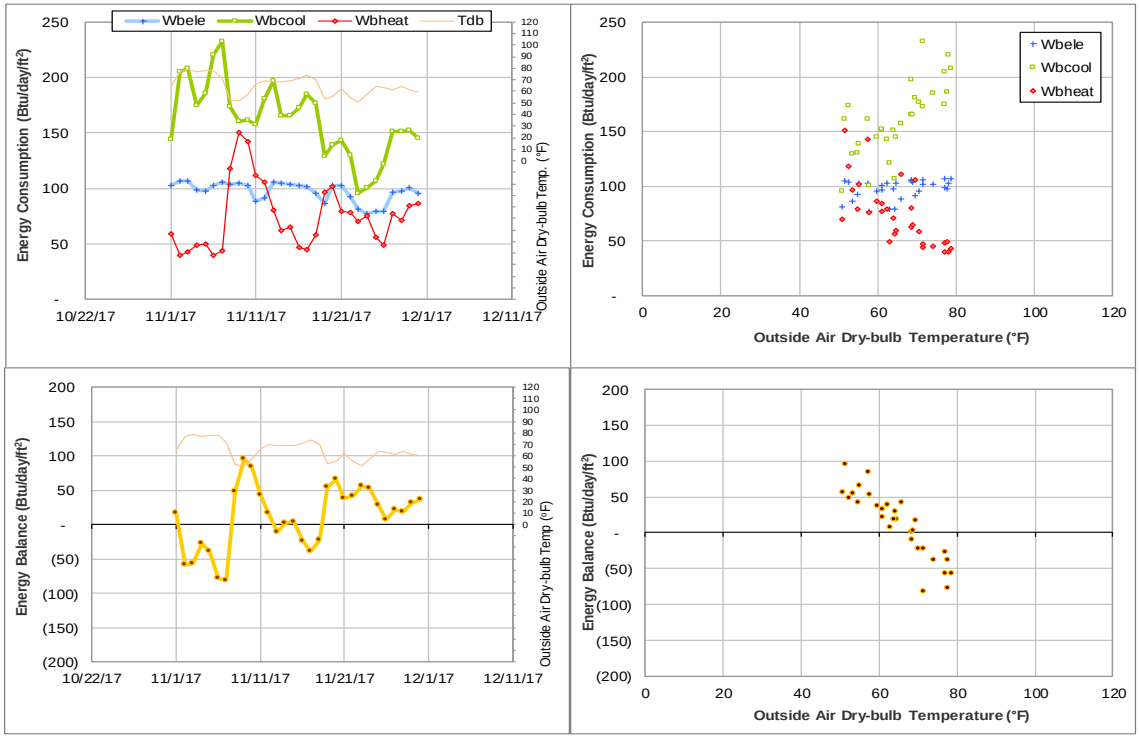


Figure IV-163 Price Hobgood Ag. Engineering Research Lab TAMU BLDG # 1508 Energy Balance Plot during November 2017

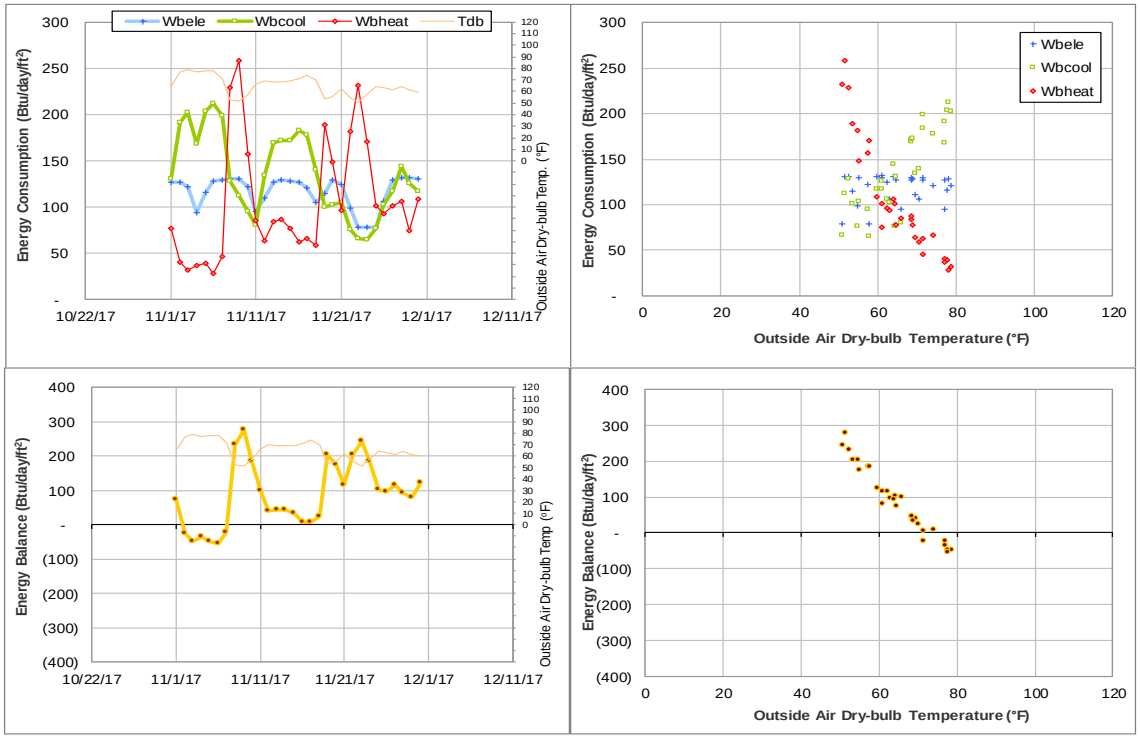


Figure IV-164 Medical Sciences Library TAMU BLDG # 1509 Energy Balance Plot during November 2017

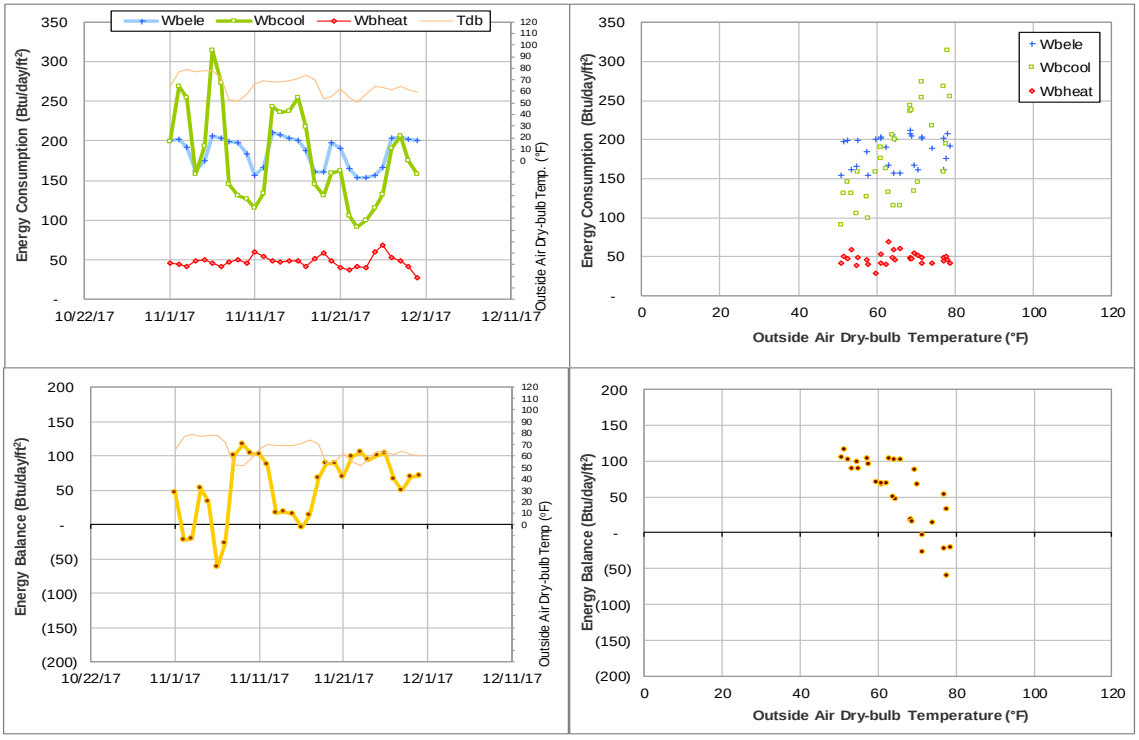


Figure IV-165 Wehner Building TAMU BLDG # 1510 Energy Balance Plot during November 2017

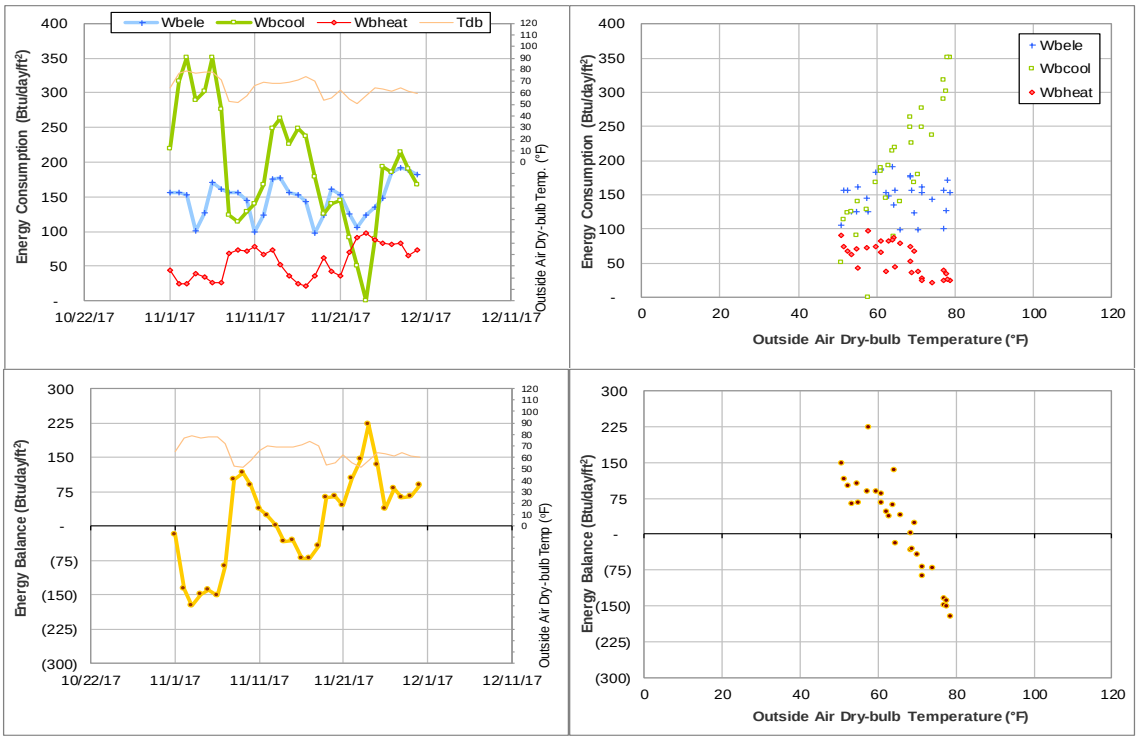


Figure IV-166 West Campus Library Facility TAMU BLDG # 1511 Energy Balance Plot during November 2017

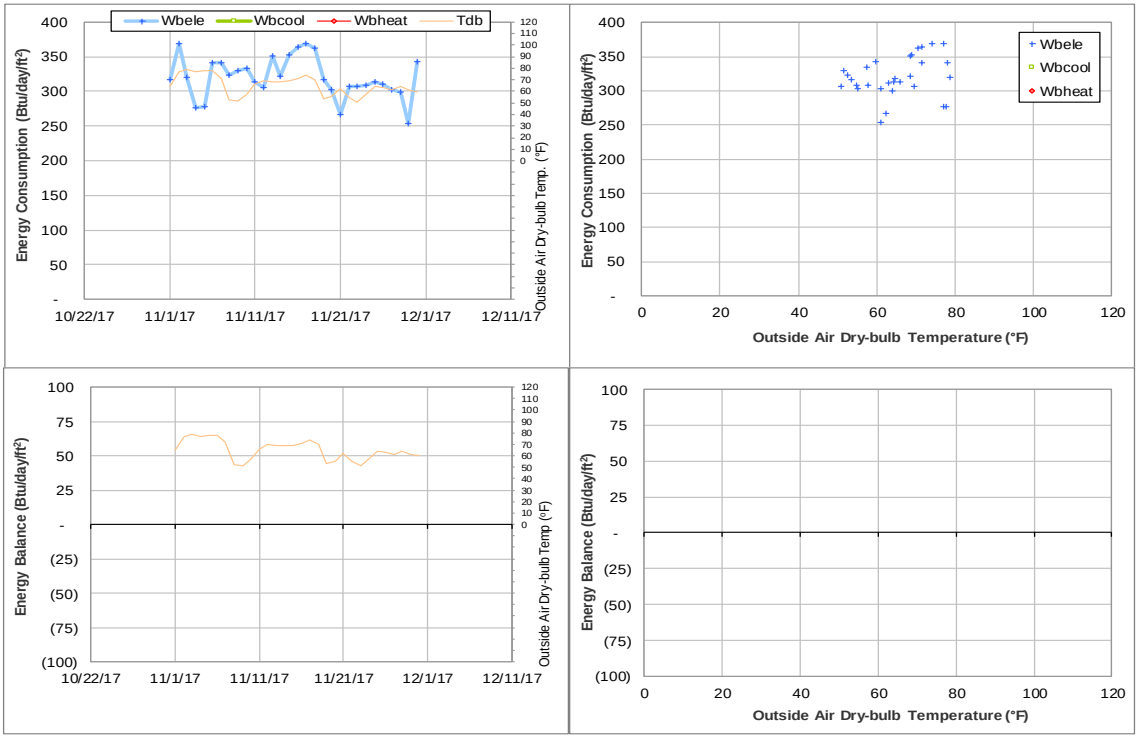


Figure IV-167 Southern Crop Improvement Greenhouse TAMU BLDG # 1512 Energy Balance Plot during November 2017

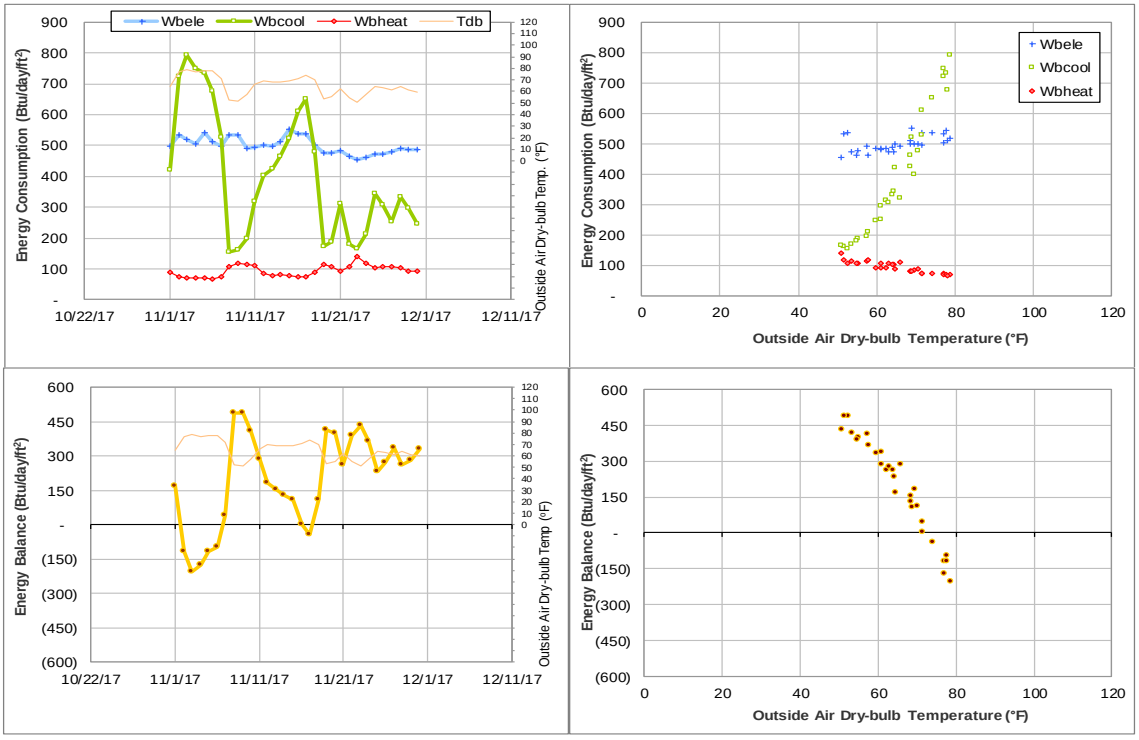


Figure IV-168 Borlaug Center for Southern Crop Improvement TAMU BLDG # 1513 Energy Balance Plot during November 2017

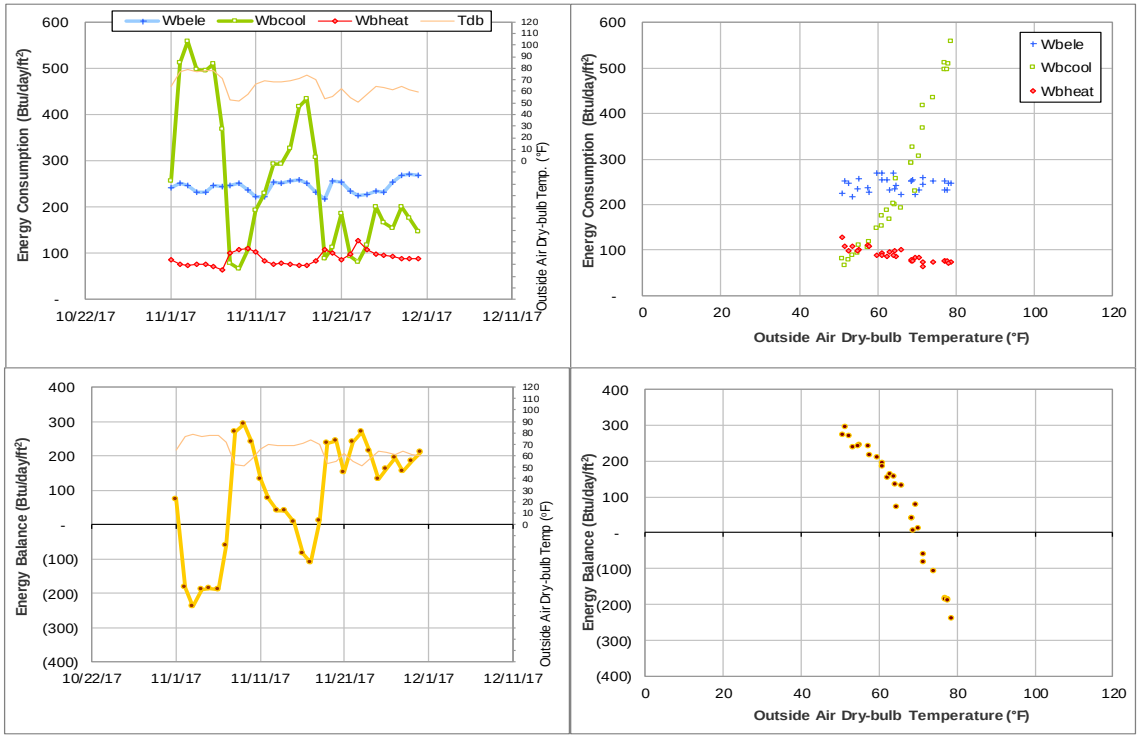


Figure IV-169 TX School of Rural Public Health TAMU BLDG # 1518 Energy Balance Plot during November 2017

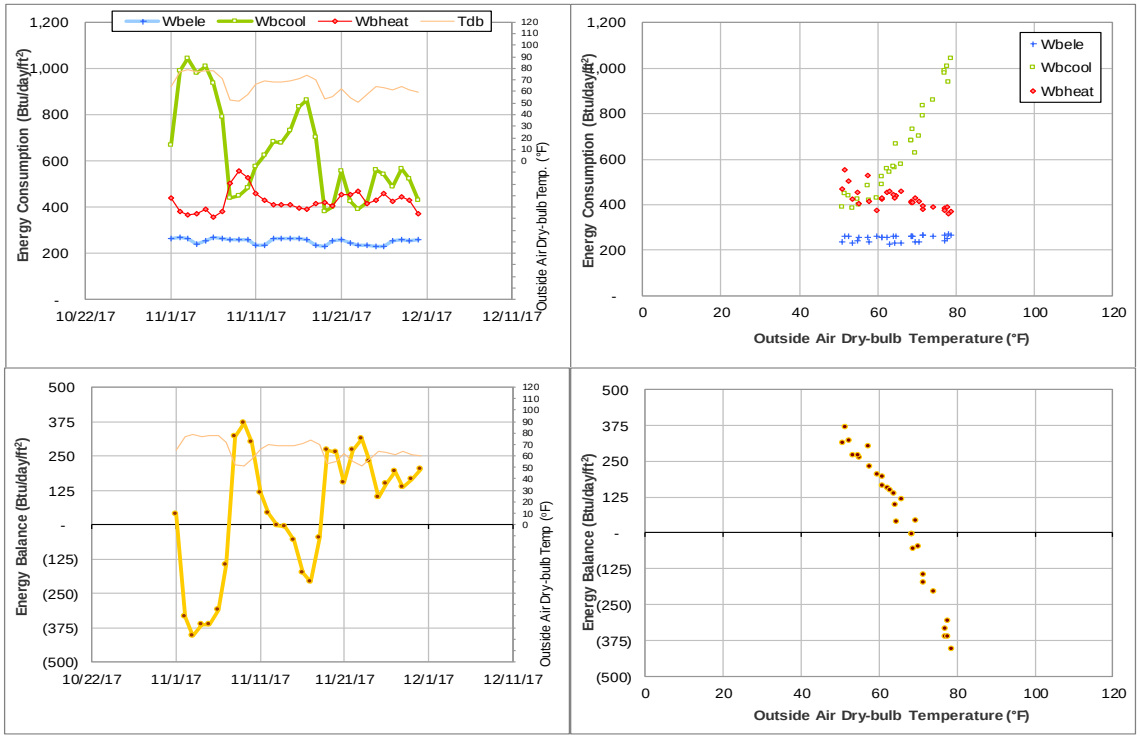


Figure IV-170 Nuclear Magnetic Resonance Facility TAMU BLDG # 1525 Energy Balance Plot during November 2017

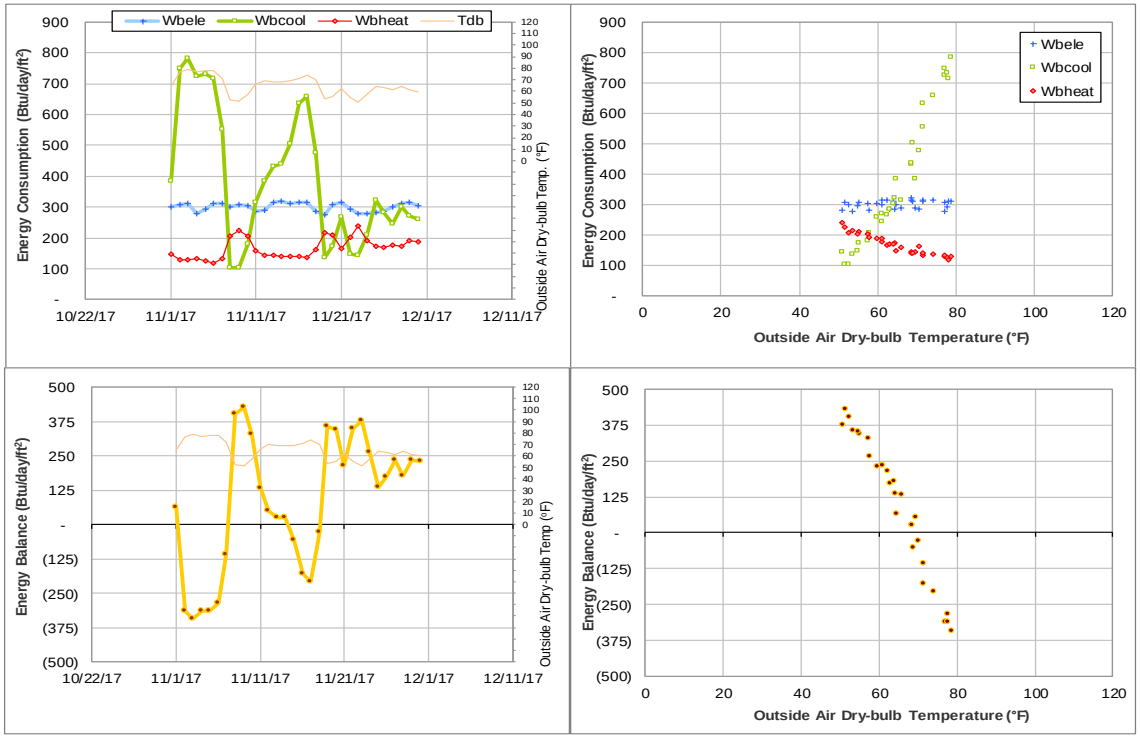


Figure IV-171 Interdisciplinary Life Sciences Building TAMU BLDG # 1530 Energy Balance Plot during November 2017

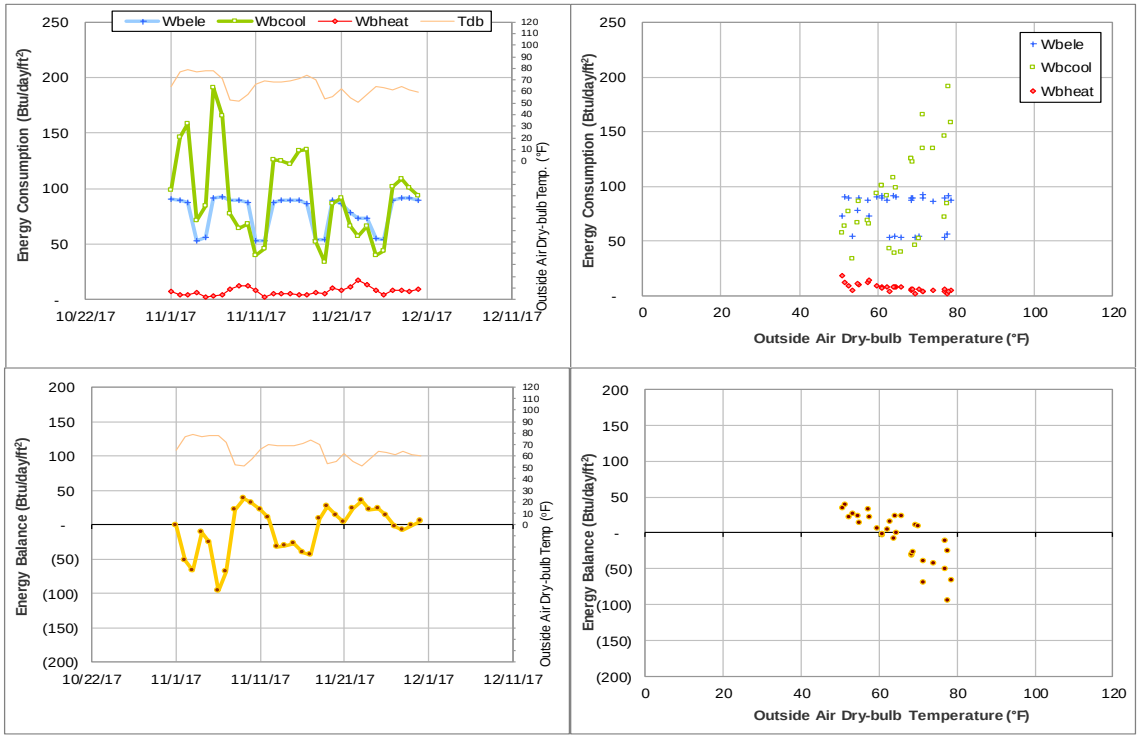


Figure IV-172 Agriculture and Life Sciences Building TAMU BLDG # 1535 Energy Balance Plot during November 2017

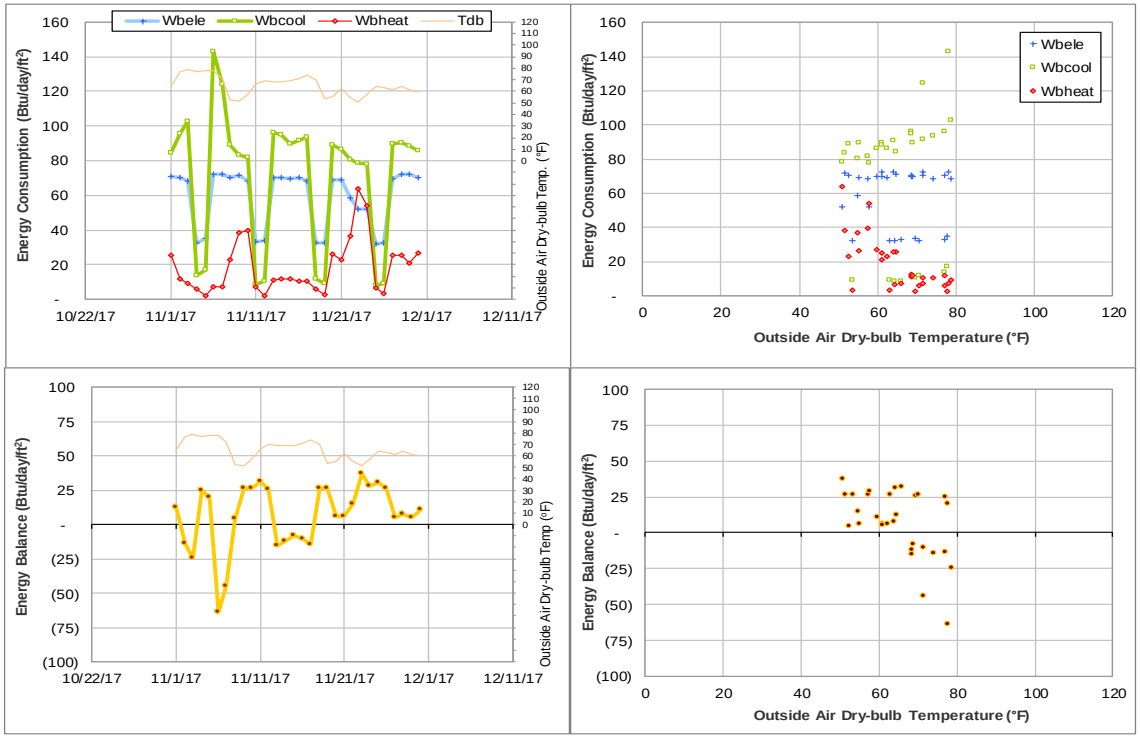


Figure IV-173 AgriLife Services Building TAMU BLDG # 1536 Energy Balance Plot during November 2017

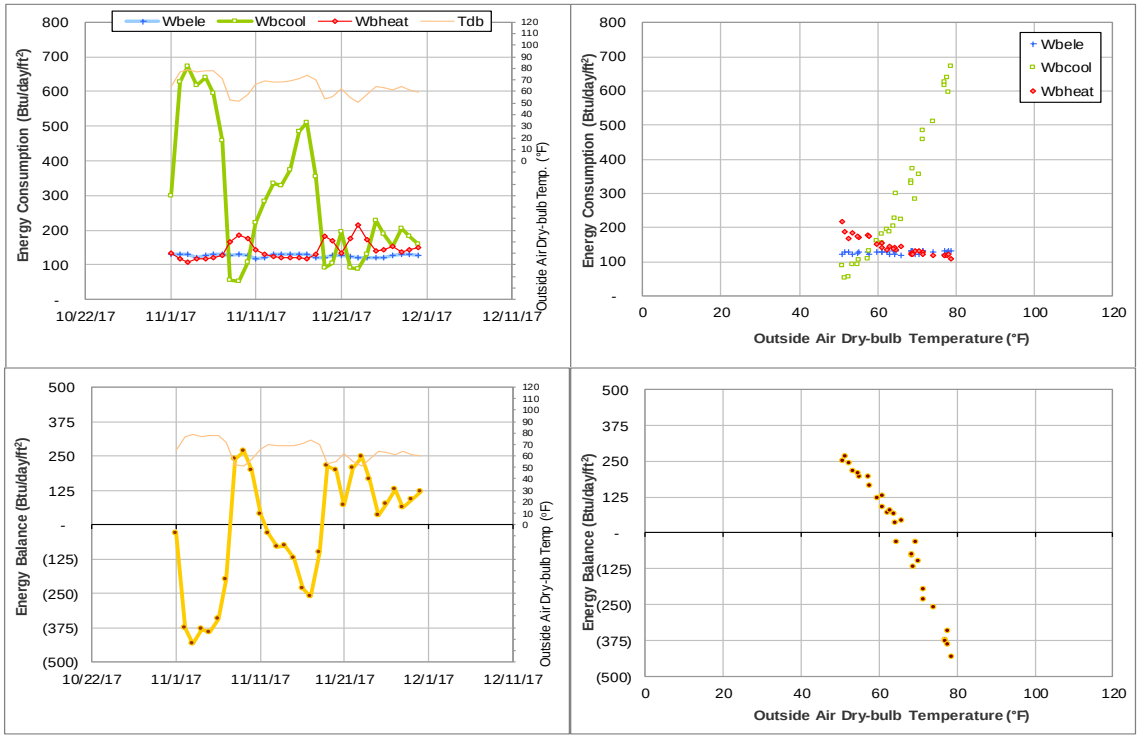


Figure IV-174 Wildlife Fisheries & Ecological Sciences Building TAMU BLDG # 1537 Energy Balance Plot during November 2017

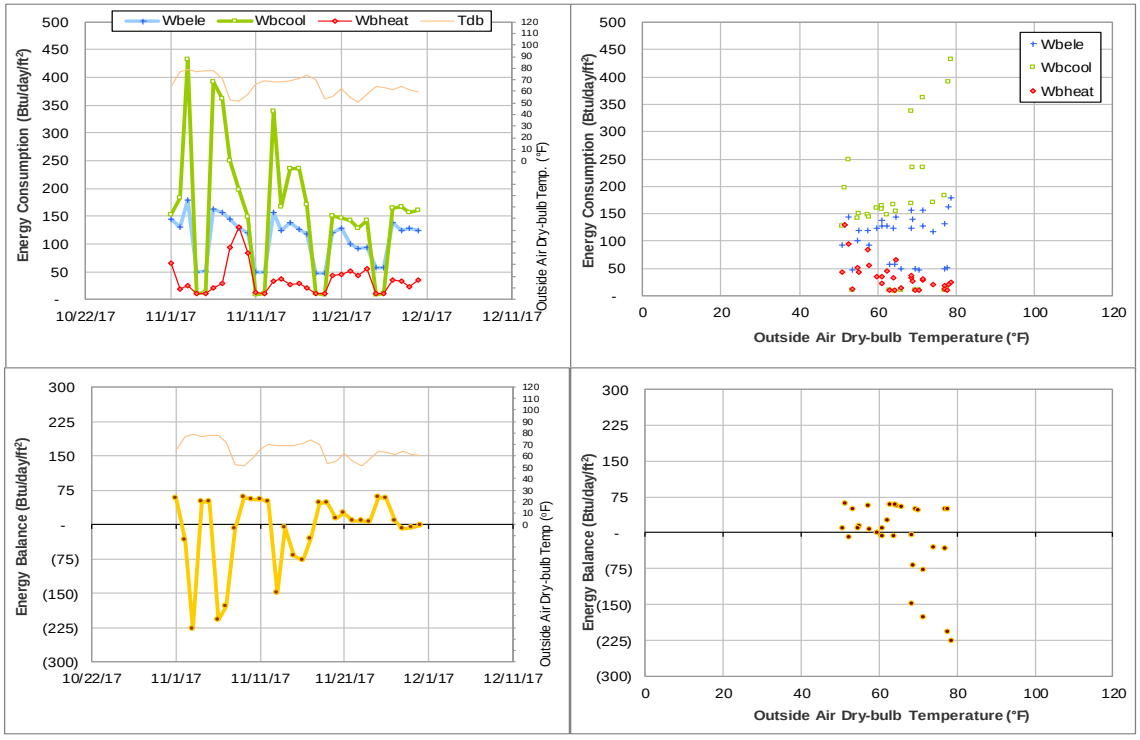


Figure IV-175 Agriculture Program Visitors Center TAMU BLDG # 1538 Energy Balance Plot during November 2017

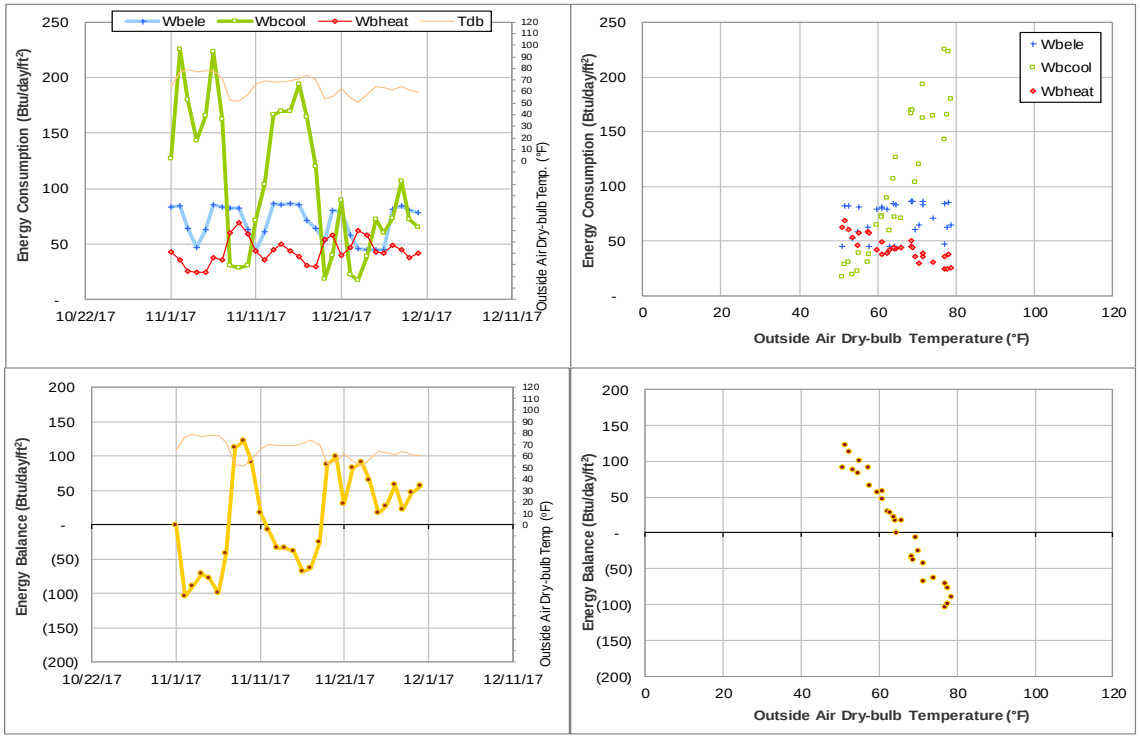


Figure IV-176 Physical Education Activity Program Building TAMU BLDG # 1540 Energy Balance Plot during November 2017

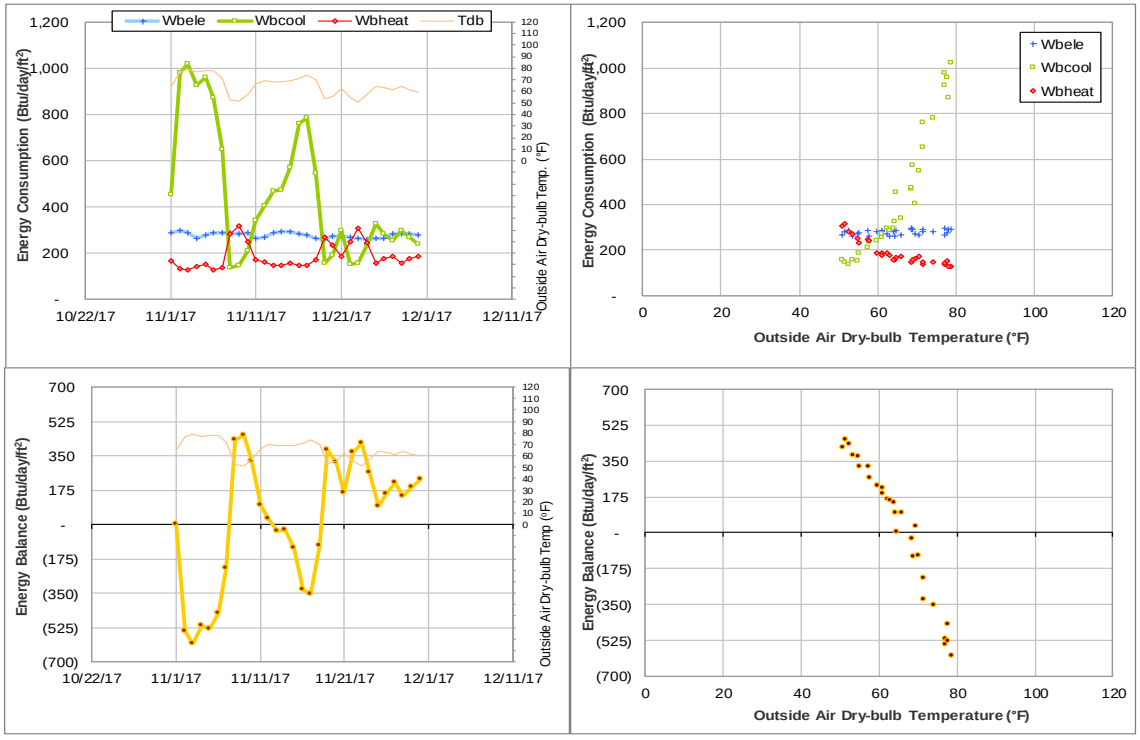


Figure IV-177 Human Clinical Research Building TAMU BLDG # 1542 Energy Balance Plot during November 2017

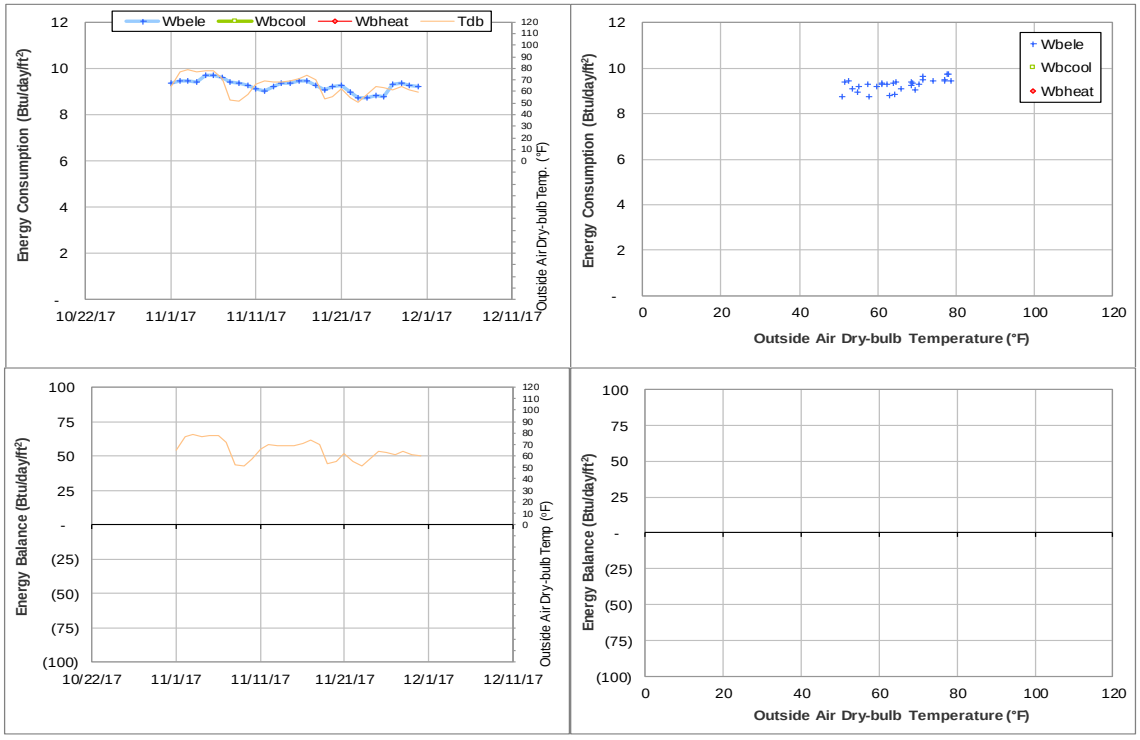


Figure IV-178 Cain Garage TAMU BLDG # 1544 Energy Balance Plot during November 2017

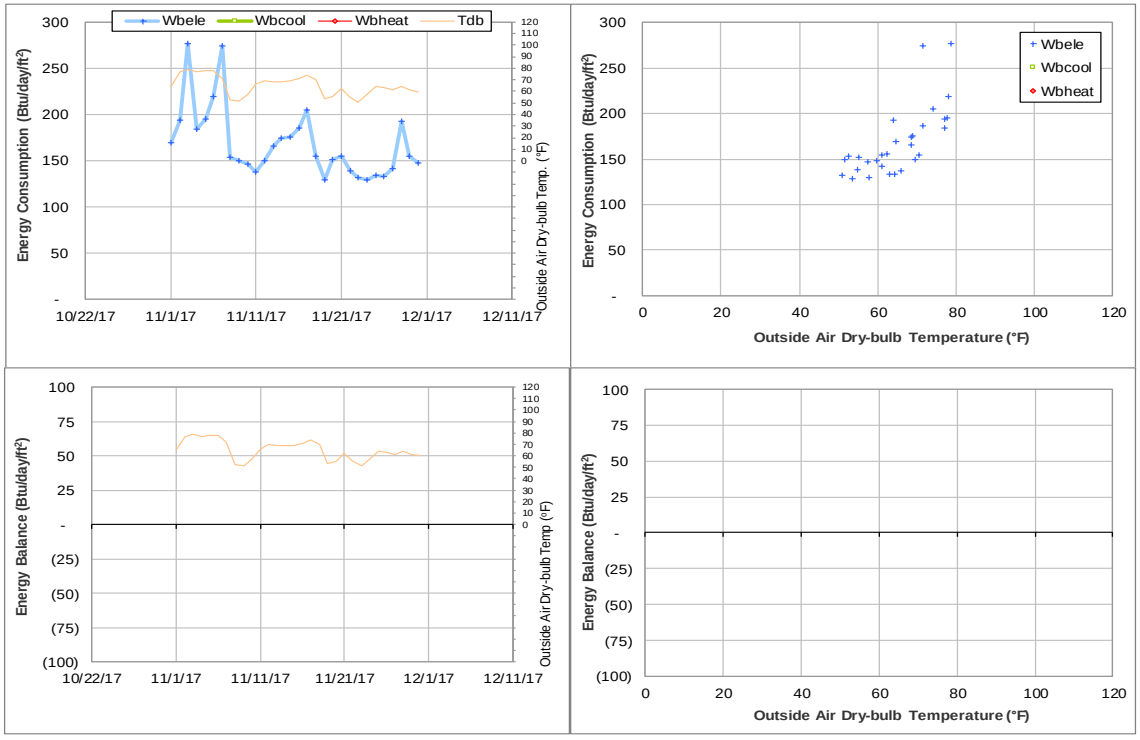


Figure IV-179 Olsen Field at Bluebell Park TAMU BLDG # 1550 Energy Balance Plot during November 2017

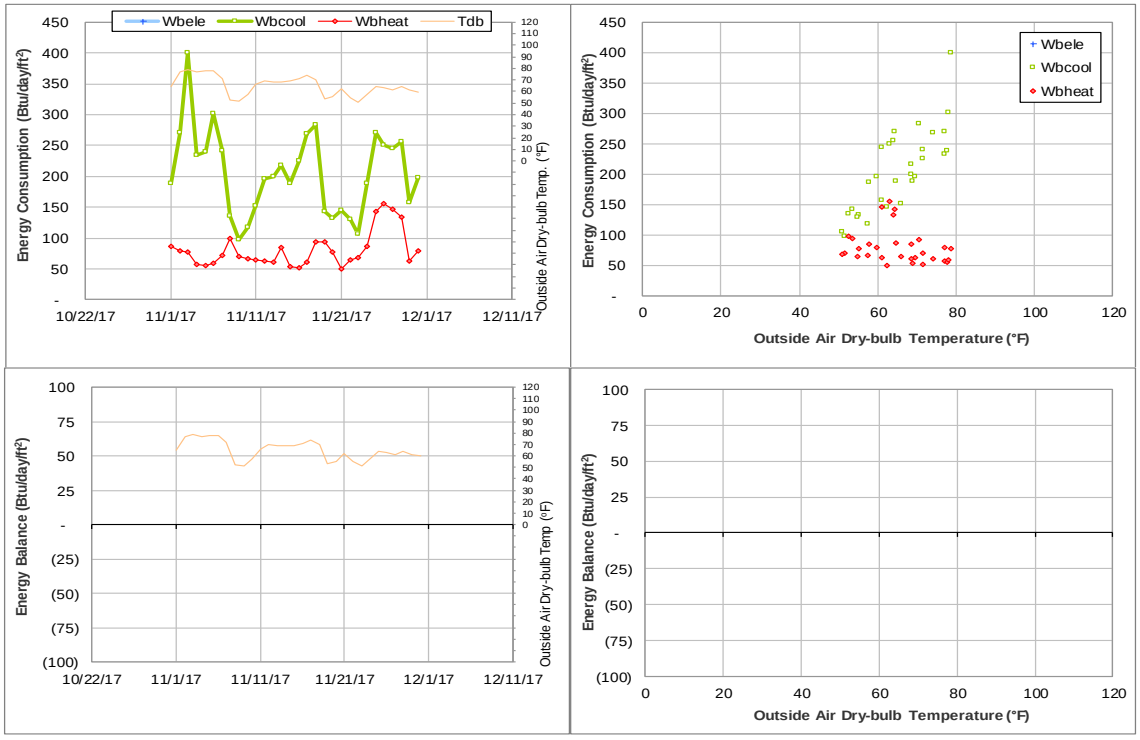


Figure IV-180 Reed Arena and Cox-McFerrin Center TAMU BLDG # 1554-1558 Energy Balance Plot during November 2017

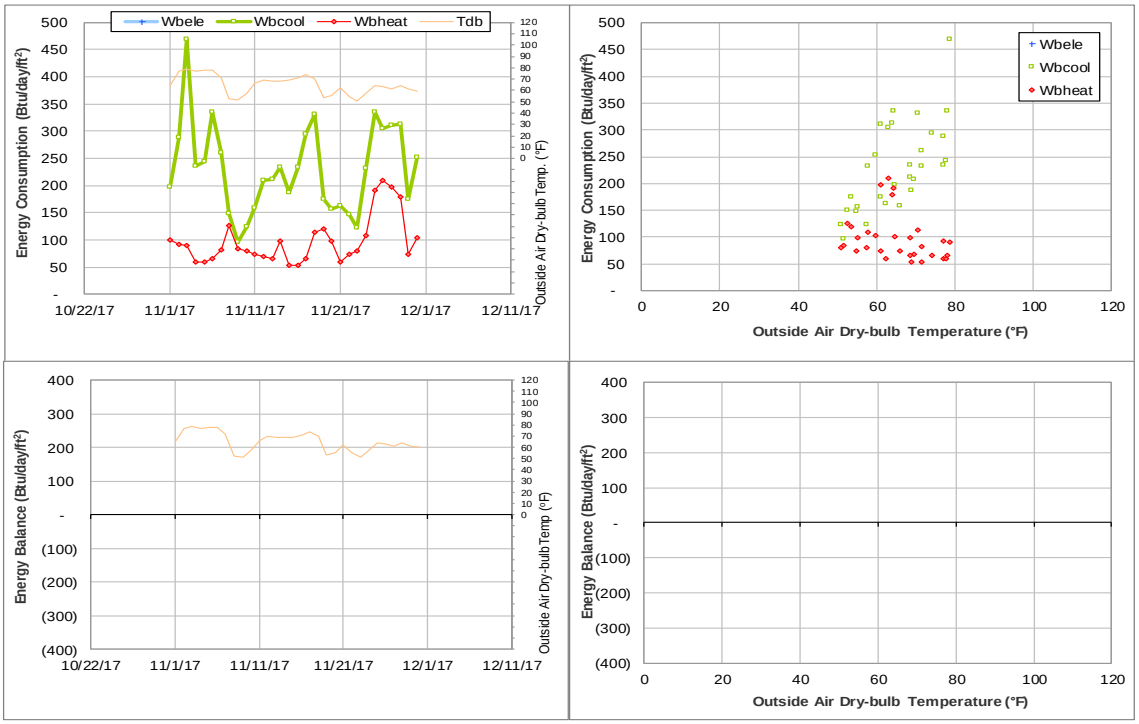


Figure IV-181 Reed Arena TAMU BLDG # 1554 Energy Balance Plot during November 2017

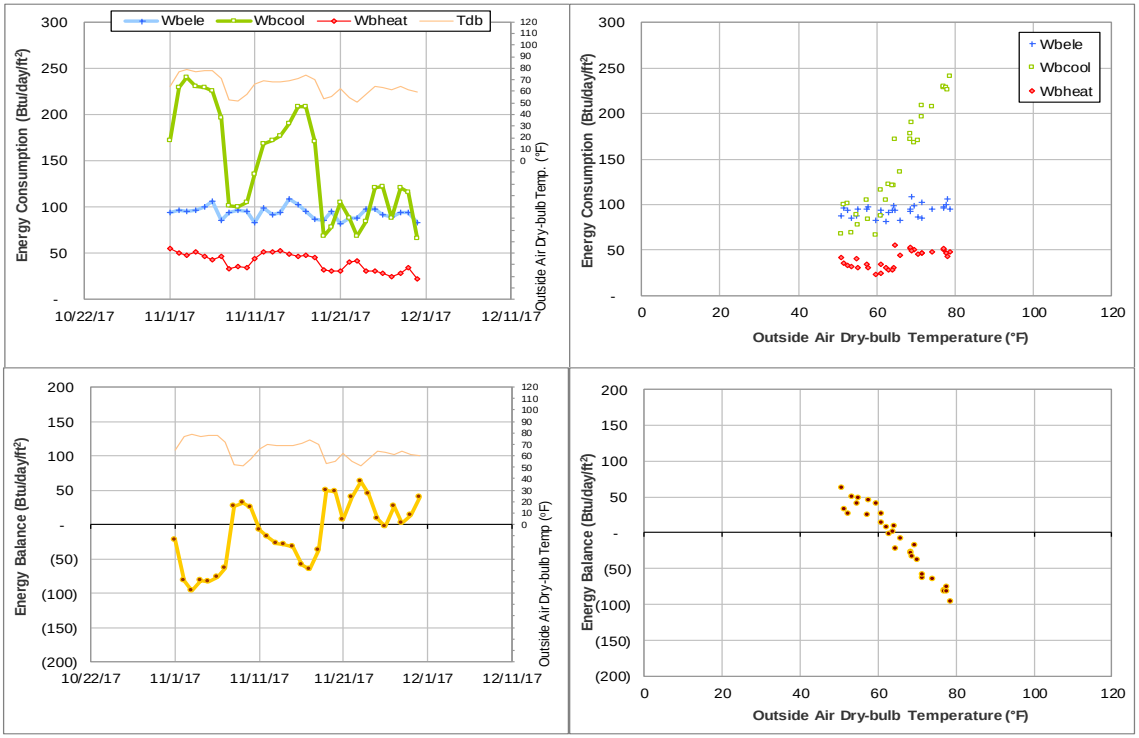


Figure IV-182 Cox-McFerrin Center for Aggie Basketball TAMU BLDG # 1558 Energy Balance Plot during November 2017

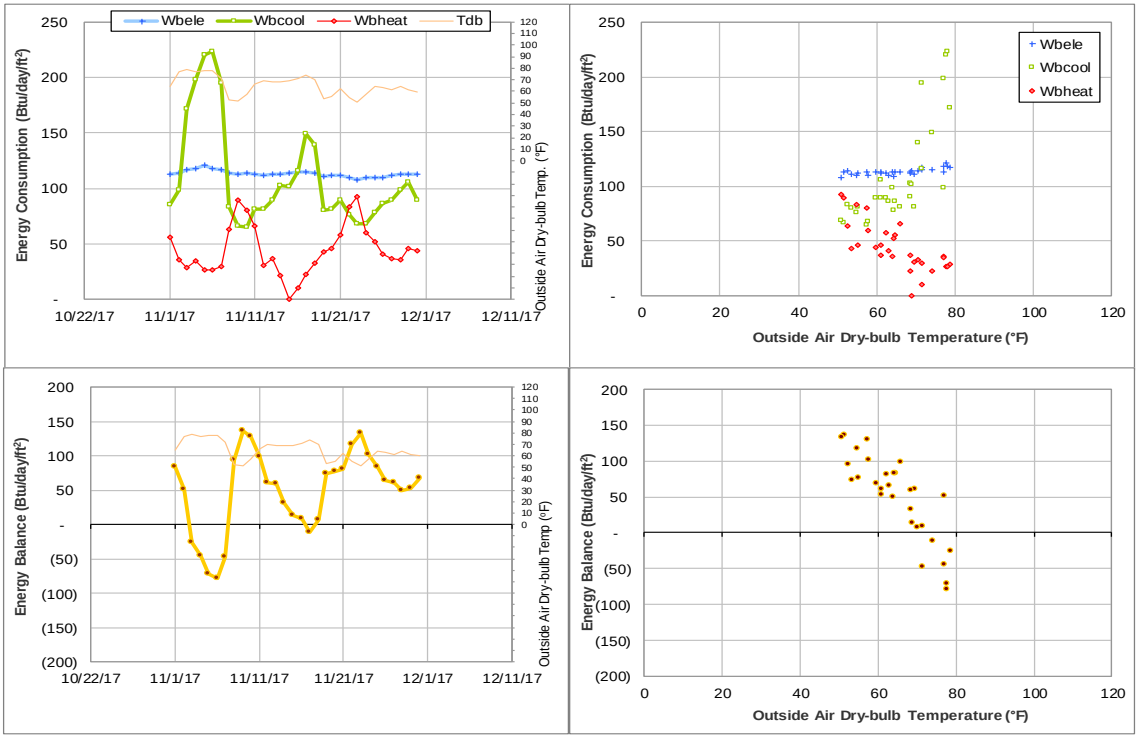


Figure IV-183 West Campus Parking Garage TAMU BLDG # 1559 Energy Balance Plot during November 2017

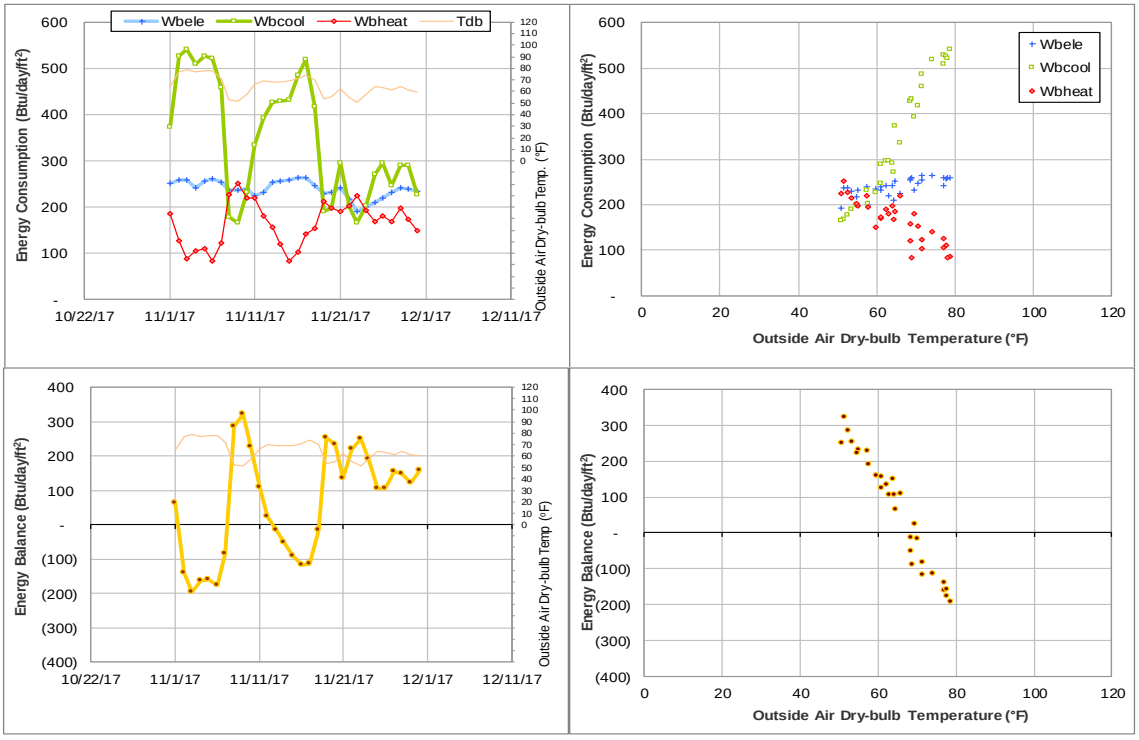


Figure IV-184 Student Recreation Center TAMU BLDG # 1560 Energy Balance Plot during November 2017

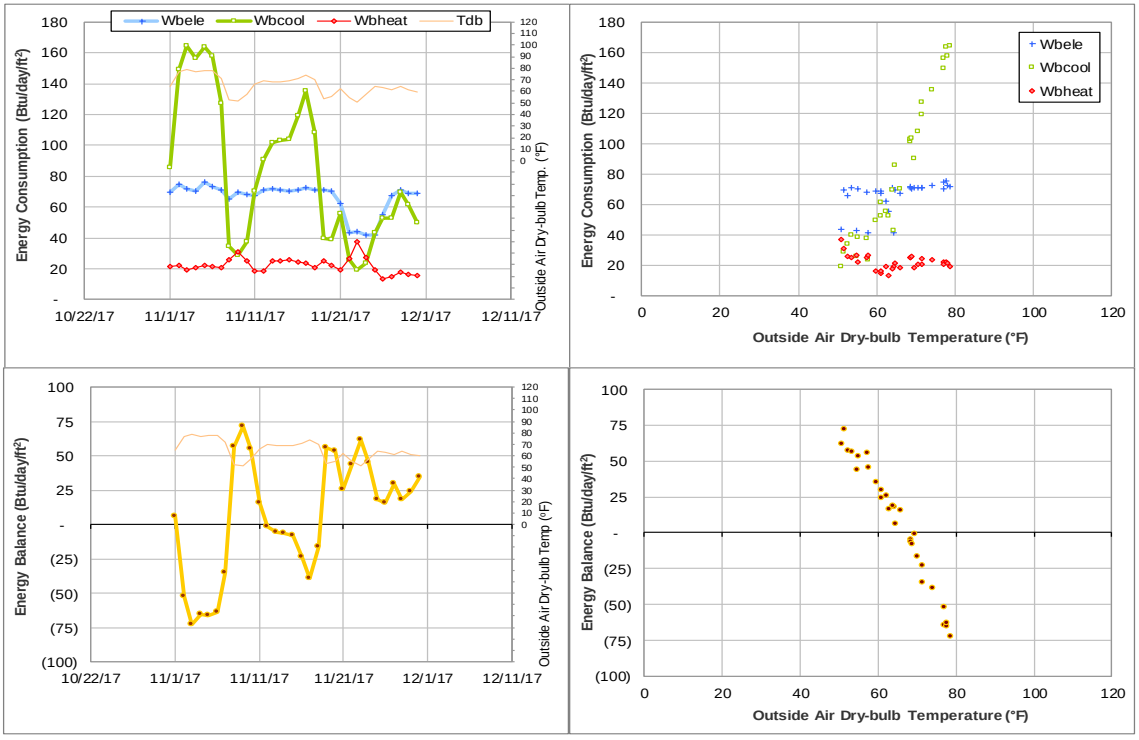


Figure IV-185 White Creek Apartment 1 and White Creek Apts Activity Center TAMU BLDG # 1589 Energy Balance Plot during November 2017

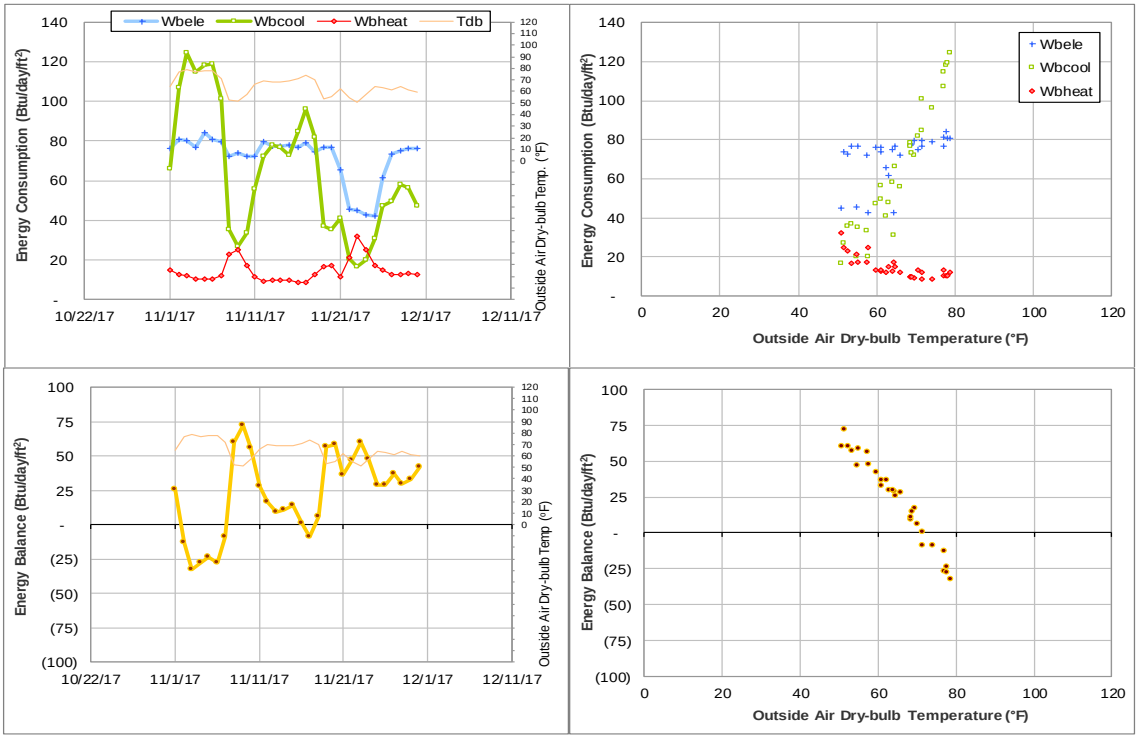


Figure IV-186 White Creek Apartment 2 TAMU BLDG # 1591 Energy Balance Plot during November 2017

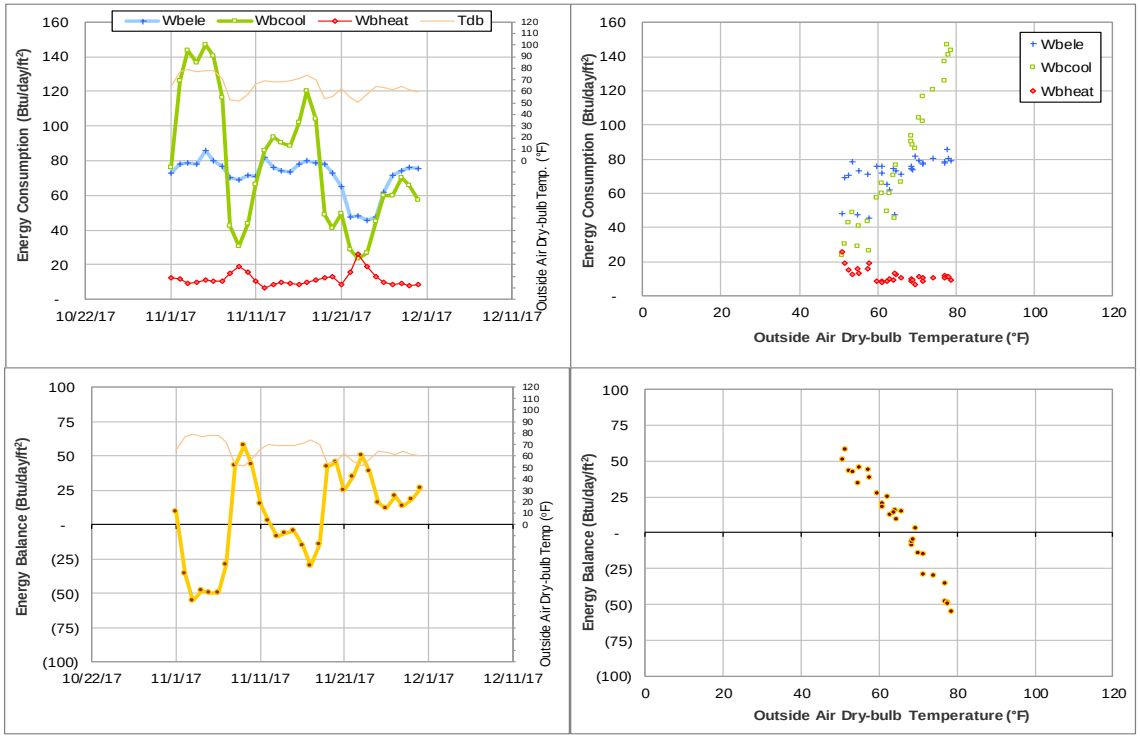


Figure IV-187 White Creek Apartment 3 TAMU BLDG # 1592 Energy Balance Plot during November 2017

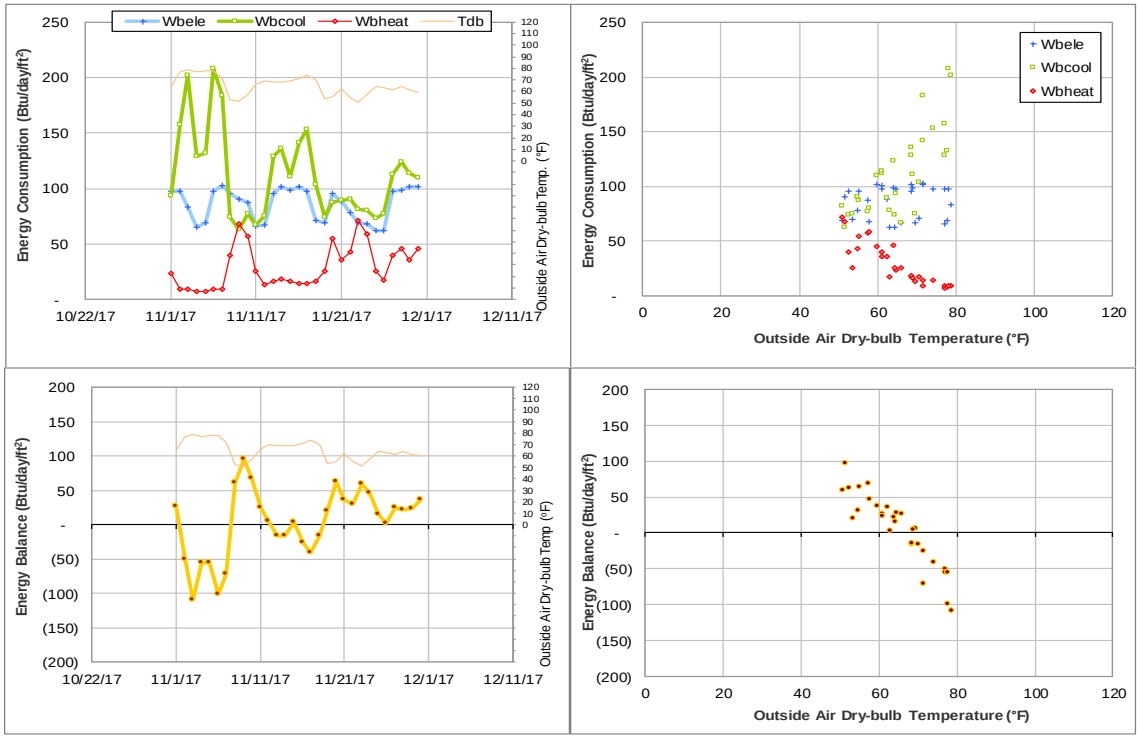


Figure IV-188 Gilchrist TTI Building TAMU BLDG # 1600 Energy Balance Plot during November 2017

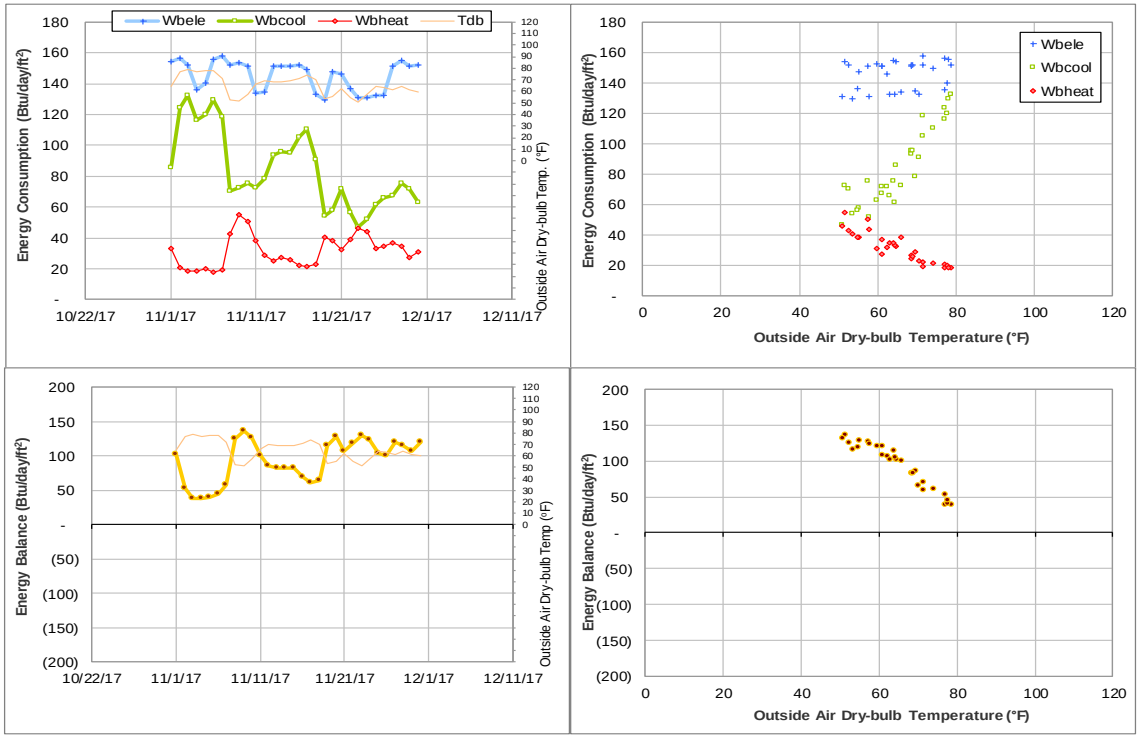


Figure IV-189 International Ocean Discovery Building TAMU BLDG # 1601 Energy Balance Plot during November 2017

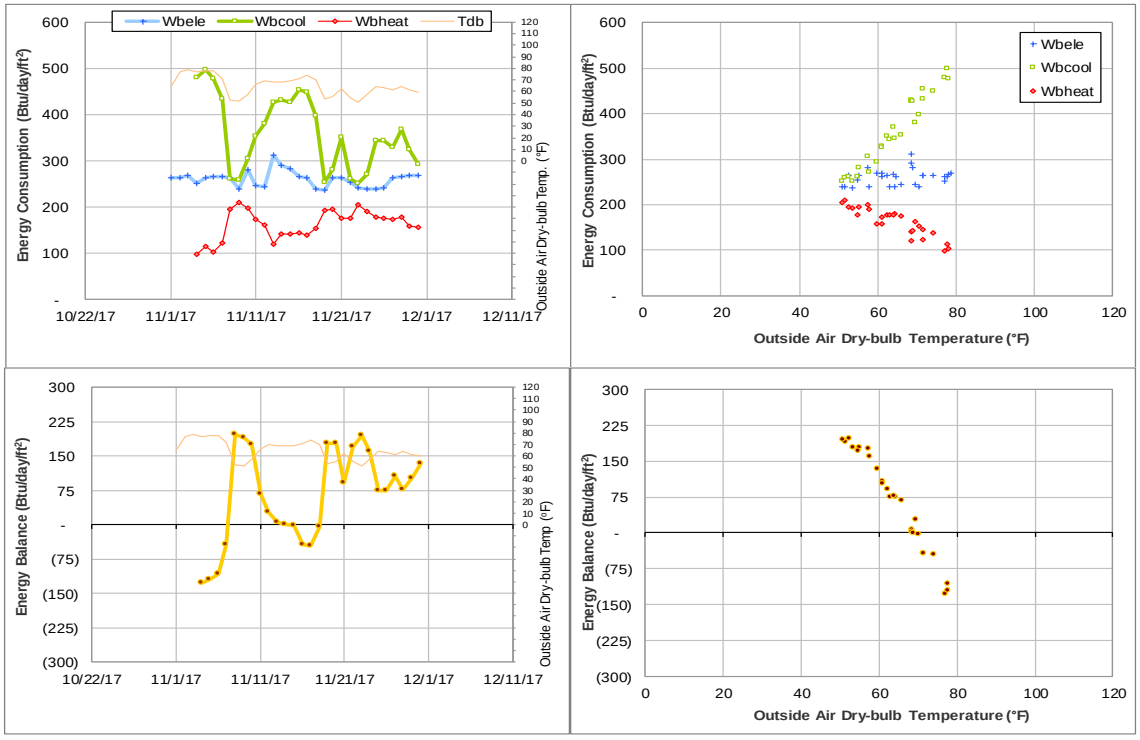


Figure IV-190 Offshore Technology Research Center TAMU BLDG # 1604 Energy Balance Plot during November 2017

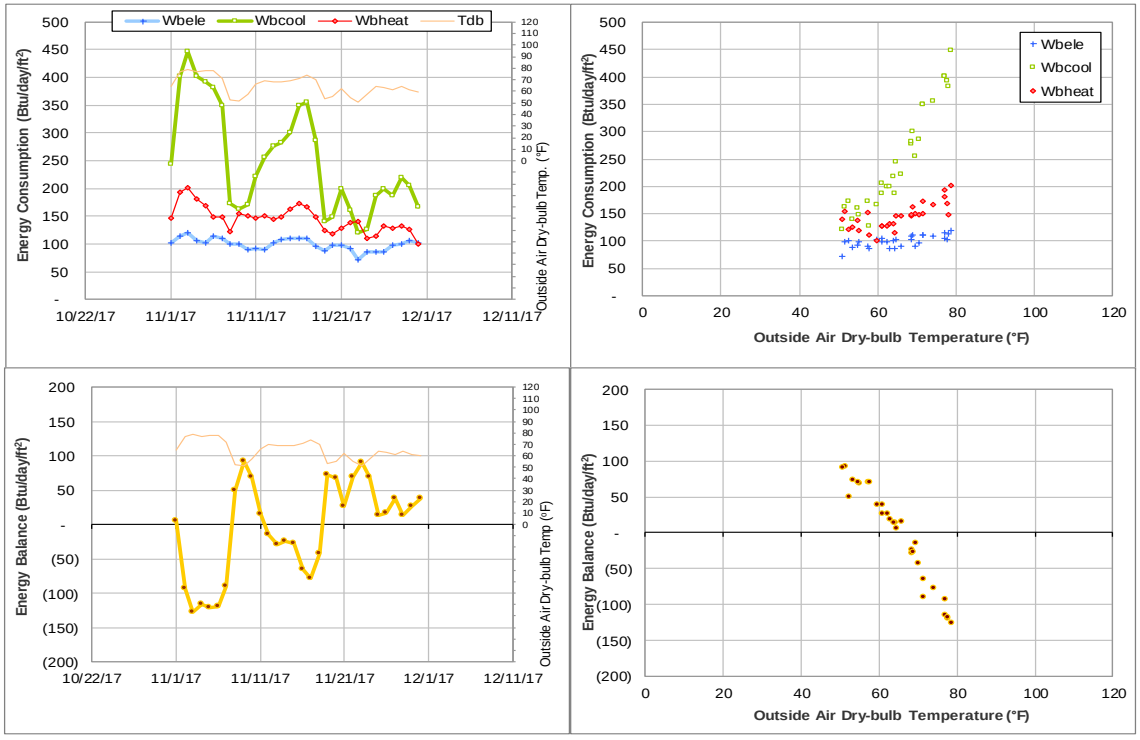


Figure IV-191 George Bush Presidential Library & Museum TAMU BLDG # 1606 Energy Balance Plot during November 2017

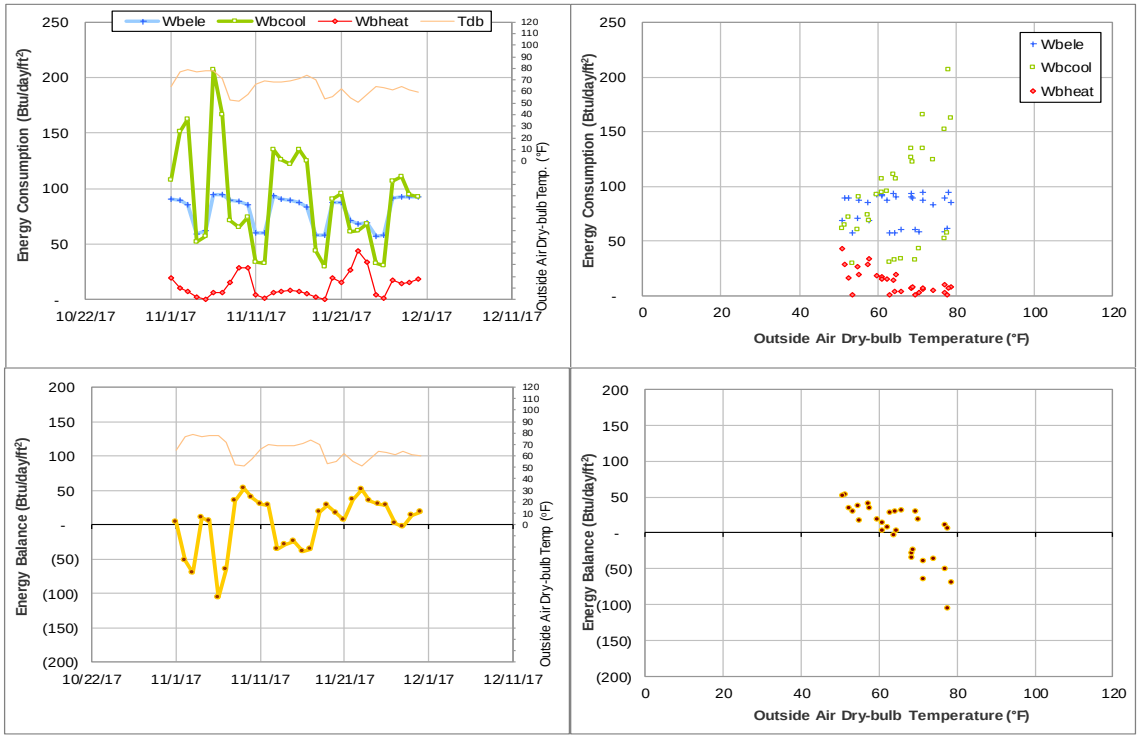


Figure IV-192 Allen Building TAMU BLDG # 1607 Energy Balance Plot during November 2017

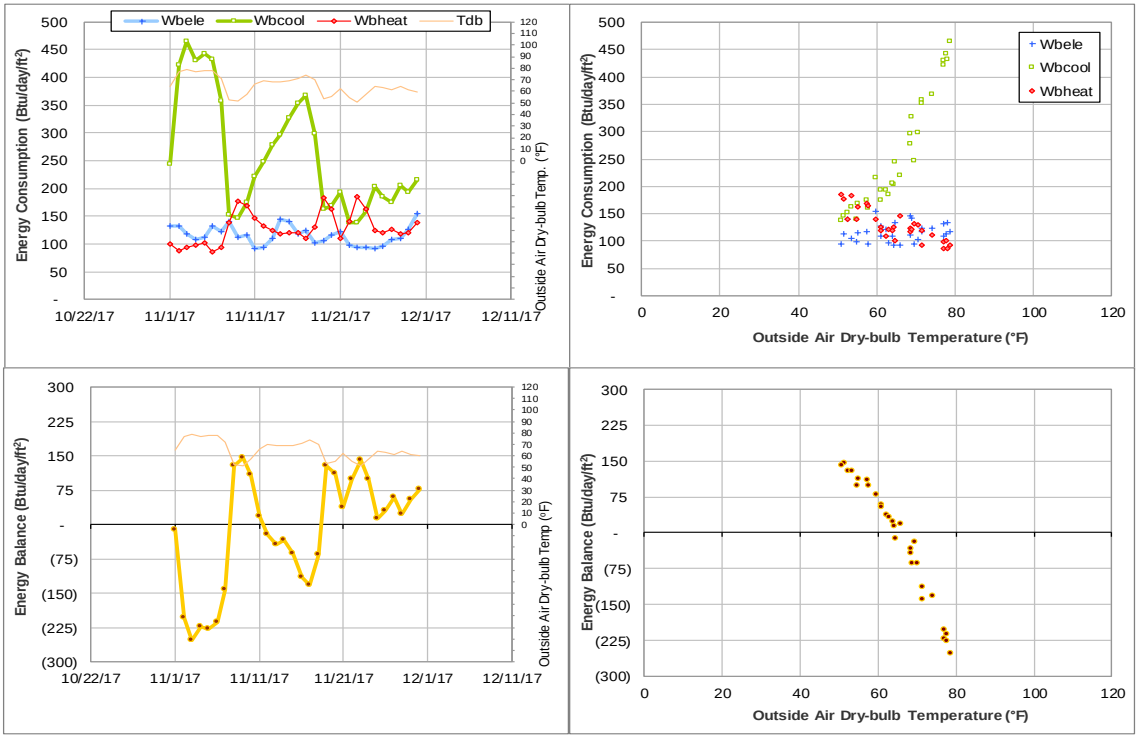


Figure IV-193 Annenberg Presidential Conference Center TAMU BLDG # 1608 Energy Balance Plot during November 2017

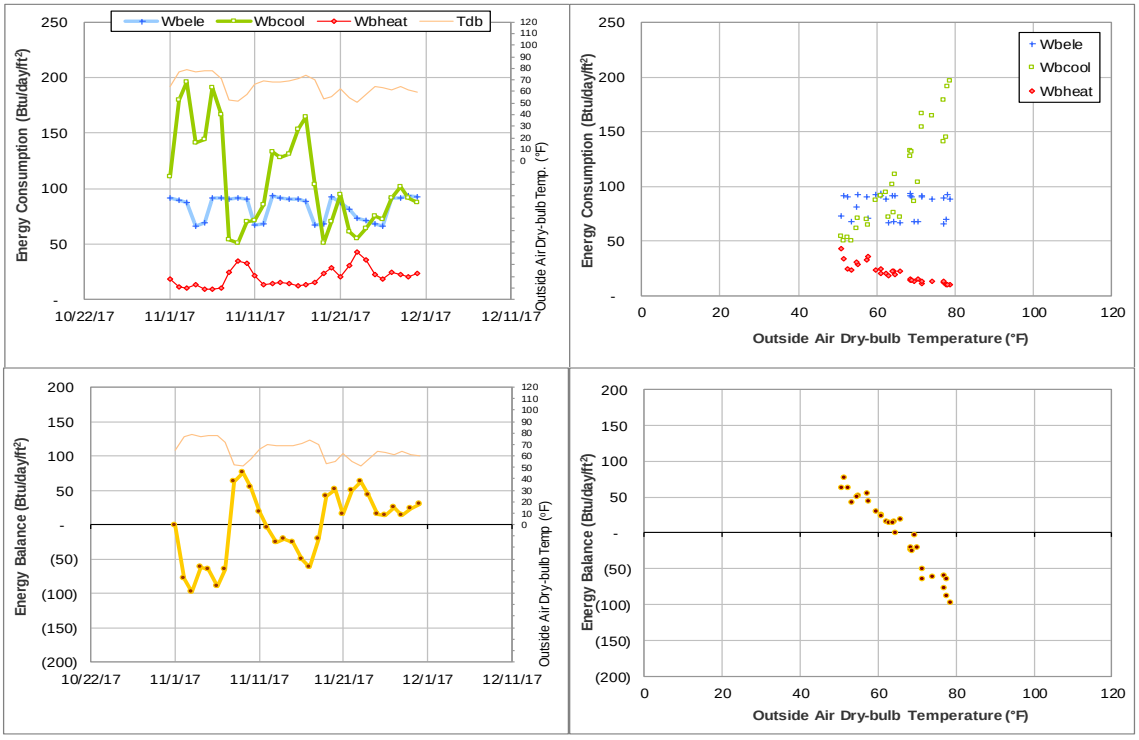


Figure IV-194 TTI Headquarters TAMU BLDG # 1609 Energy Balance Plot during November 2017

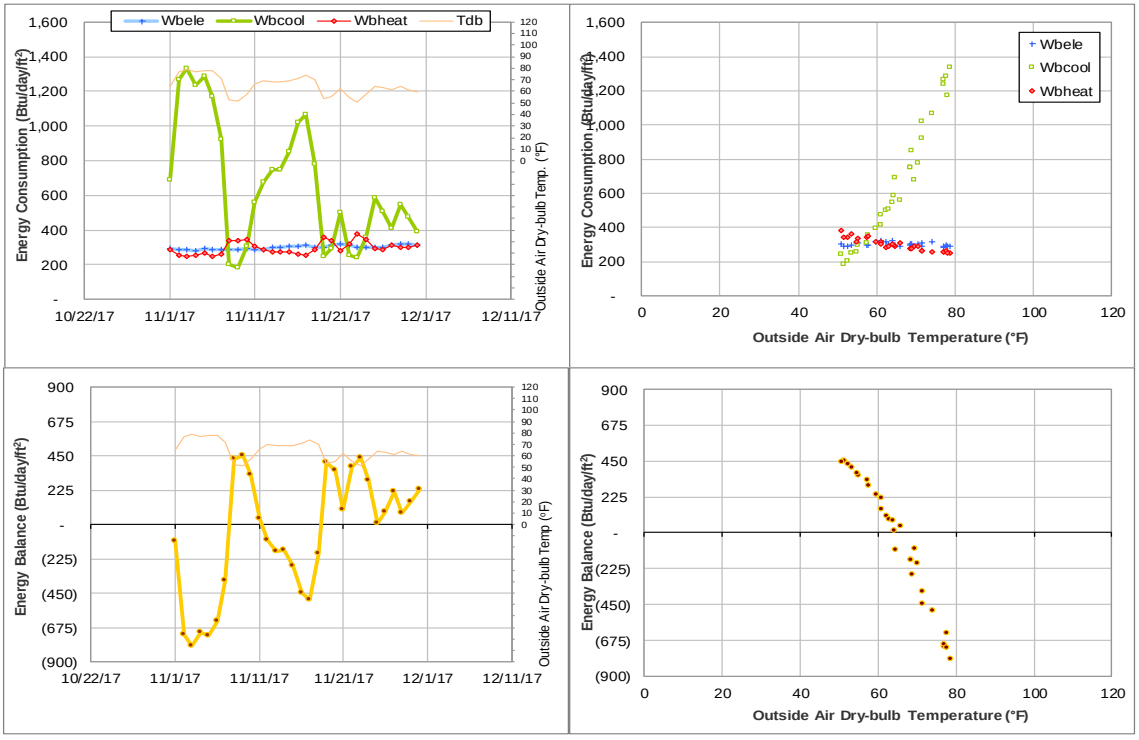


Figure IV-195 Engineering Research Building TAMU BLDG # 1611 Energy Balance Plot during November 2017

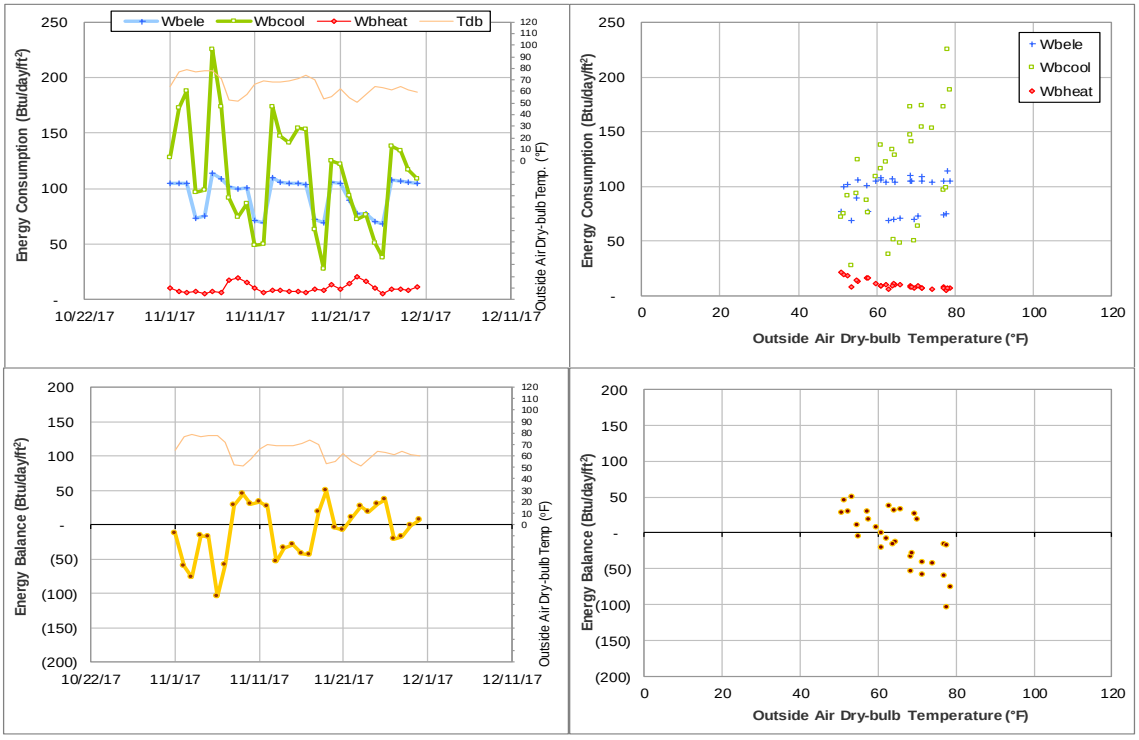


Figure IV-196 General Services Complex TAMU BLDG # 1800 Energy Balance Plot during November 2017

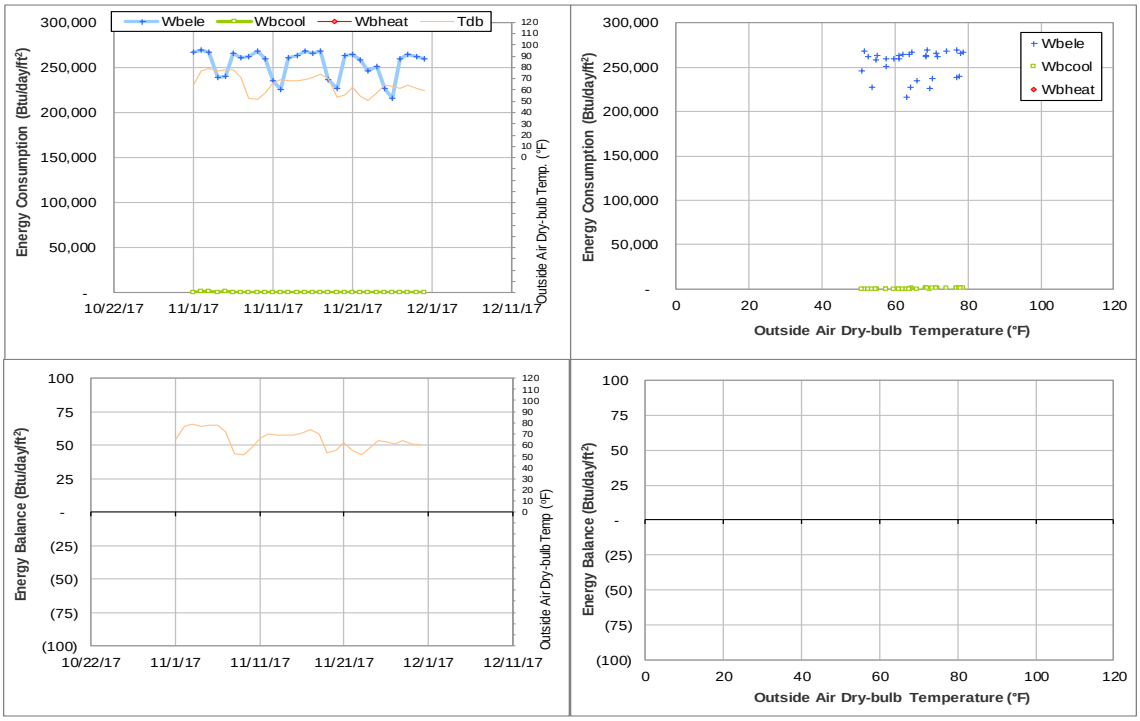


Figure IV-197 New TVMDL TAMU BLDG # 1809 Energy Balance Plot during November 2017

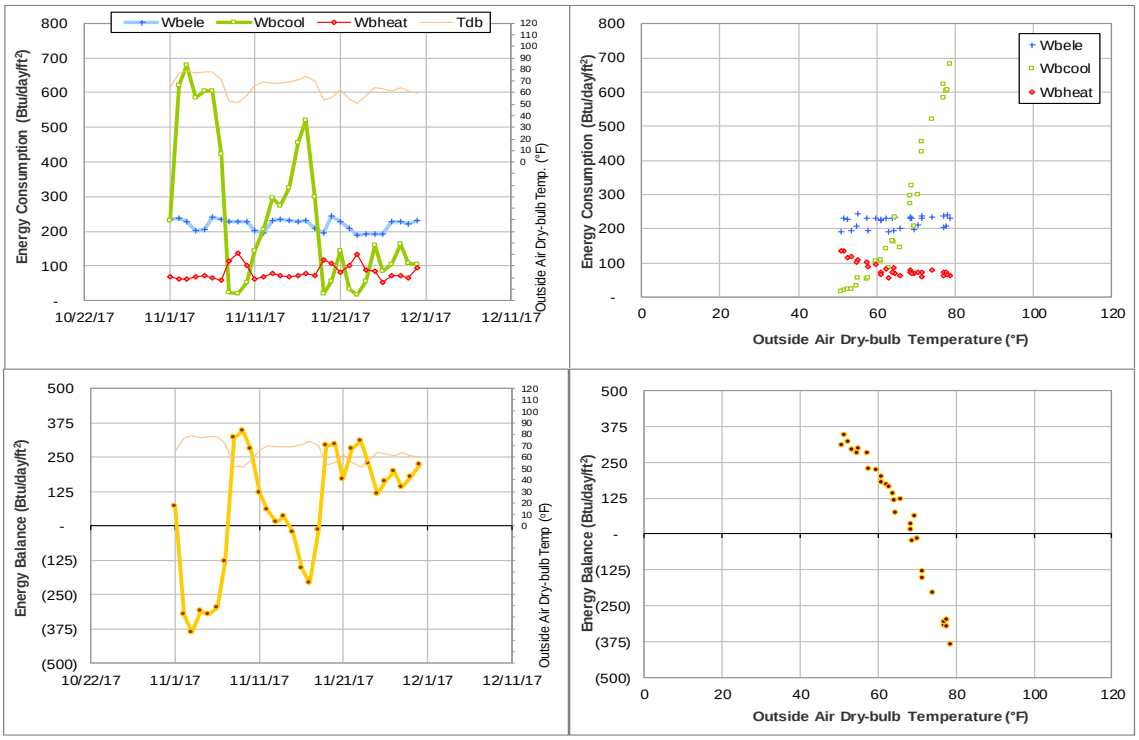


Figure IV-198 Office of the State Chemist Building TAMU BLDG # 1810 Energy Balance Plot during November 2017

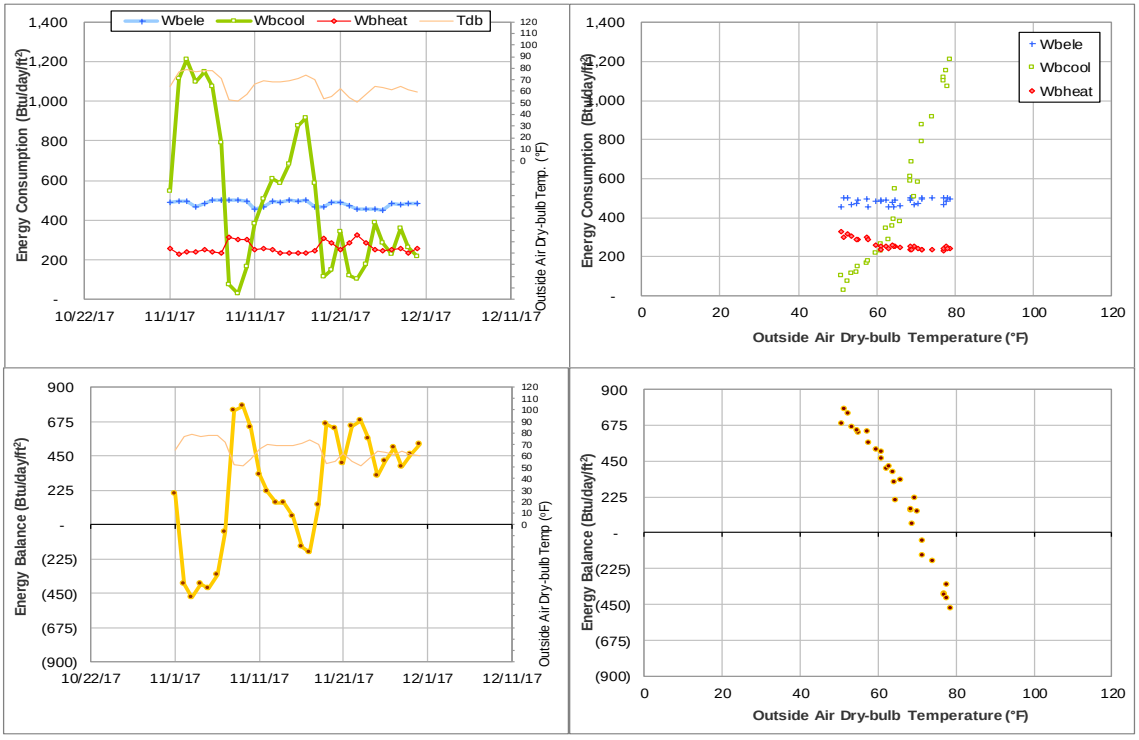


Figure IV-199 Vet Med Research Bldg Addition TAMU BLDG # 1811 Energy Balance Plot during November 2017

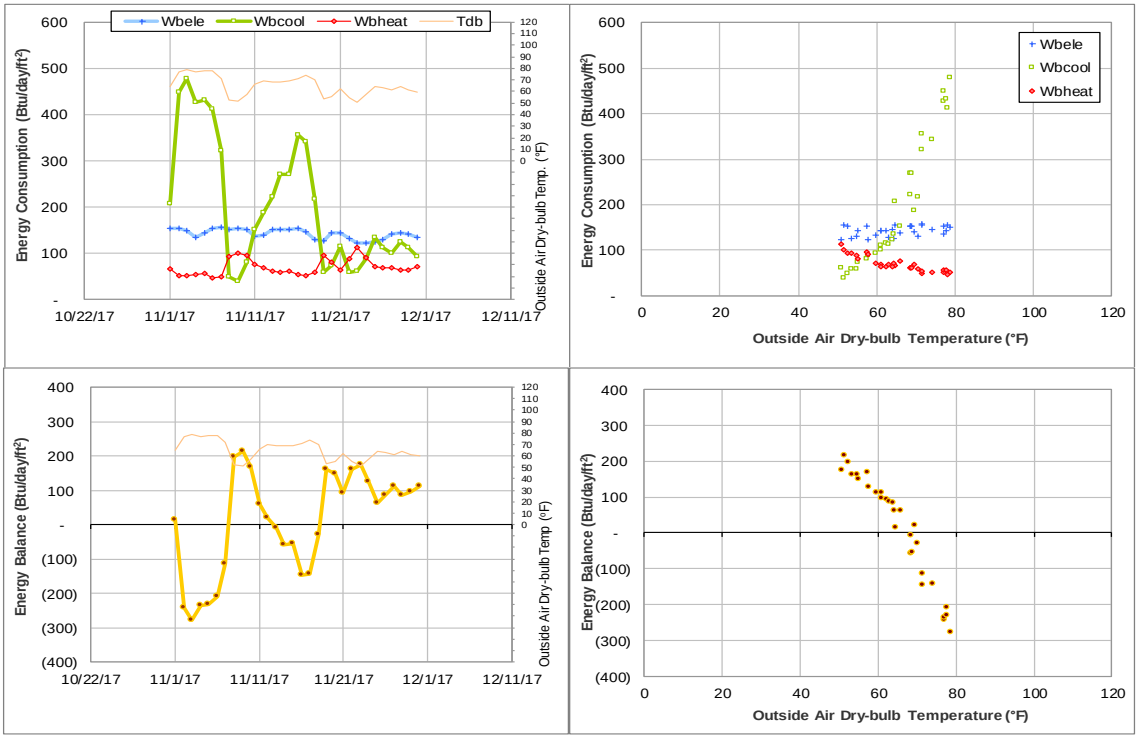


Figure IV-200 Veterinary Medicine Building 1, 2, and 3 TAMU BLDG # 1812 Energy Balance Plot during November 2017

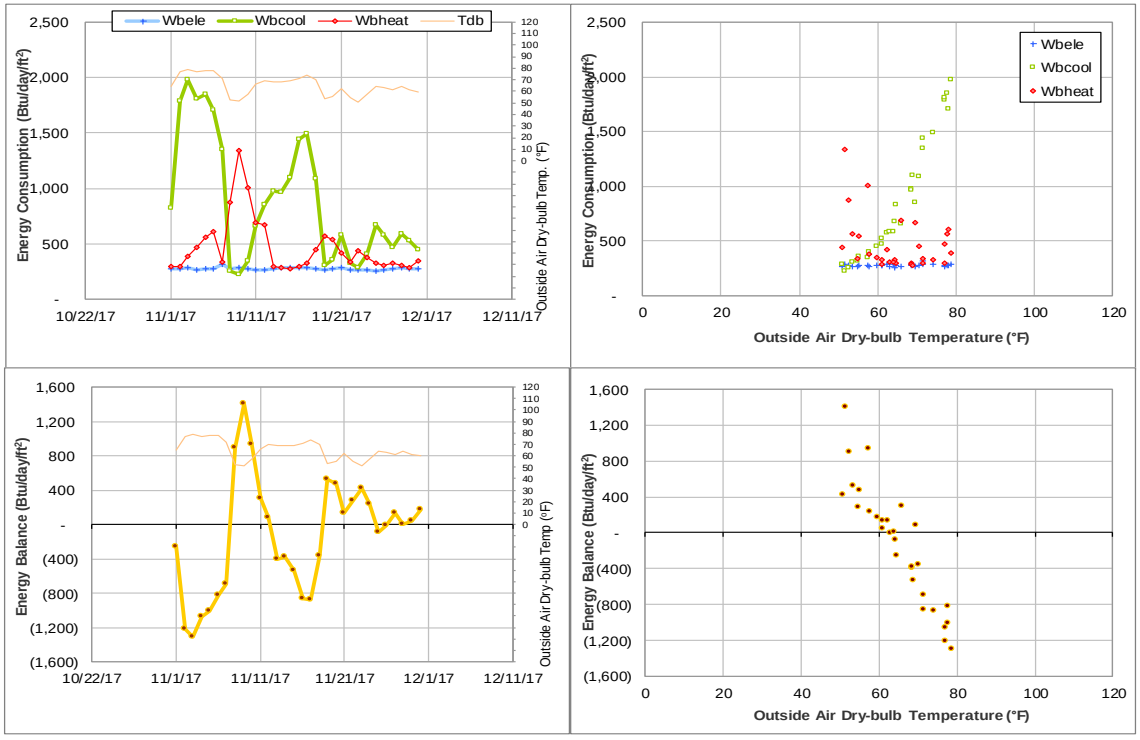


Figure IV-201 Texas Institute for Genomic Medicine TAMU BLDG # 1900 Energy Balance Plot during November 2017

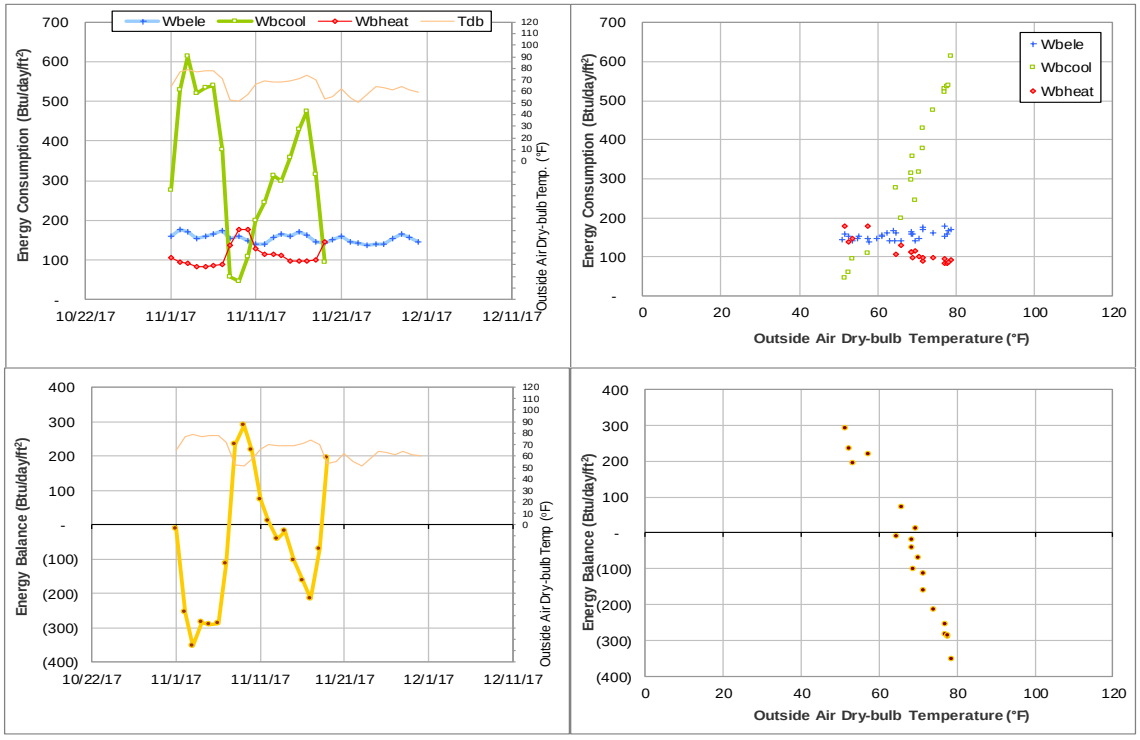


Figure IV-202 Texas A&M Institute for Preclinical Studies A TAMU BLDG # 1904 Energy Balance Plot during November 2017

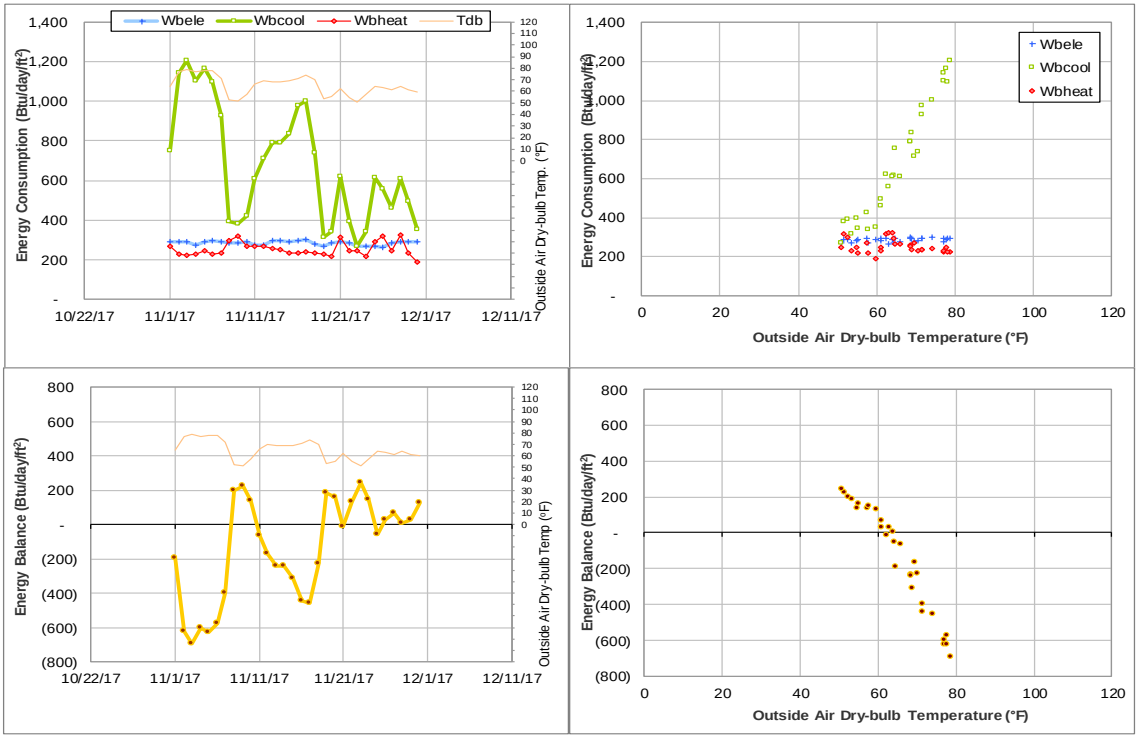


Figure IV-203 National Center for Therapeutics Manufacturing TAMU BLDG # 1910 Energy Balance Plot during November 2017

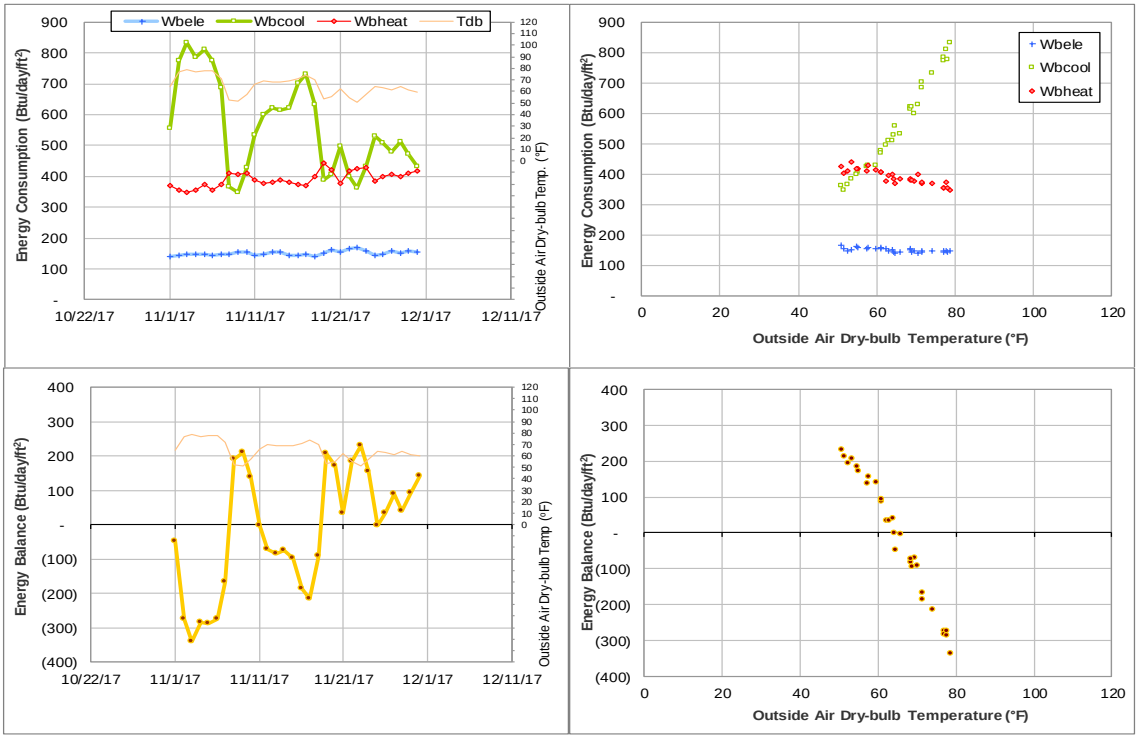


Figure IV-204 Multi-Species Research Building TAMU BLDG # 1911 Energy Balance Plot during November 2017

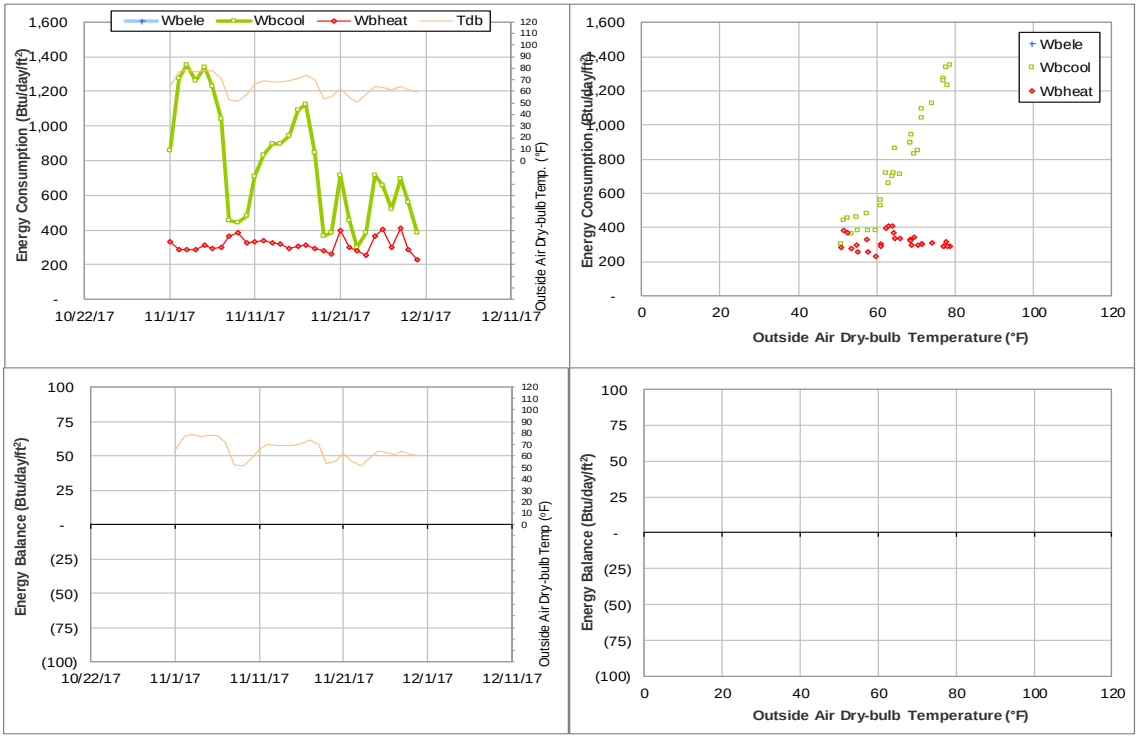


Figure IV-205 NCTM Manufacturing Building TAMU BLDG # 10226 Energy Balance Plot during November 2017

V. Energy Balance Plots with Filled-in data for November 2017 Consumption

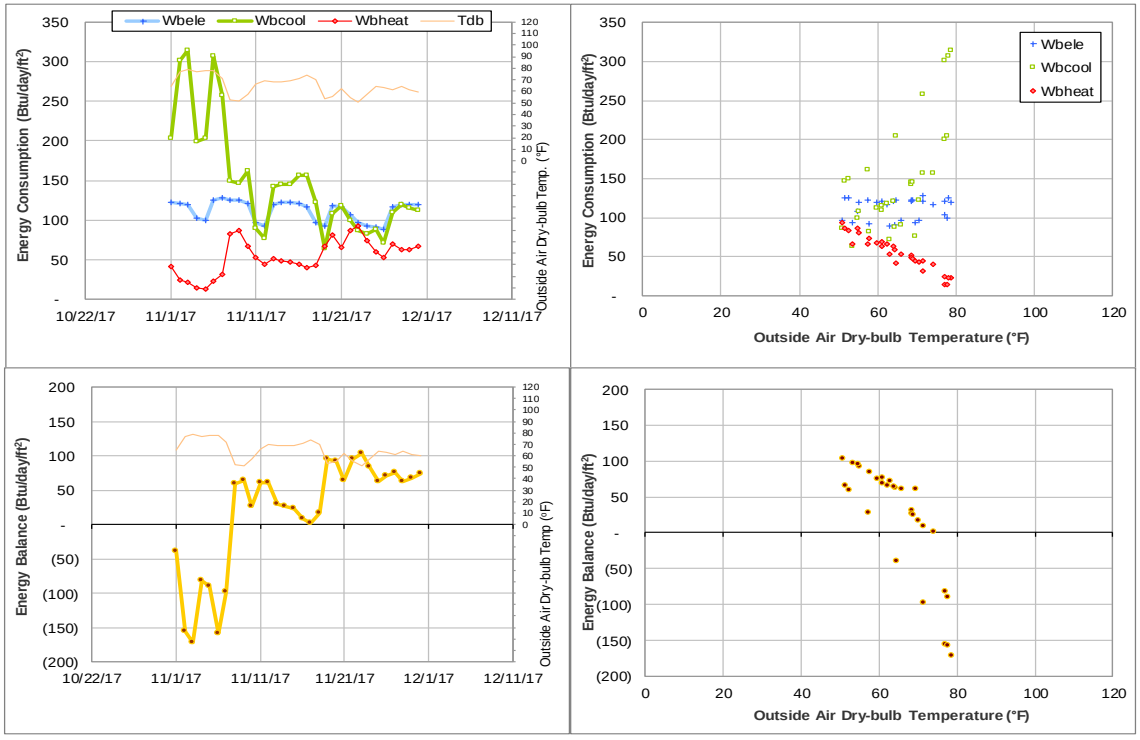


Figure V-1 CE TTI Office & Lab Building TAMU BLDG # 325 Energy Balance Plot during November 2017

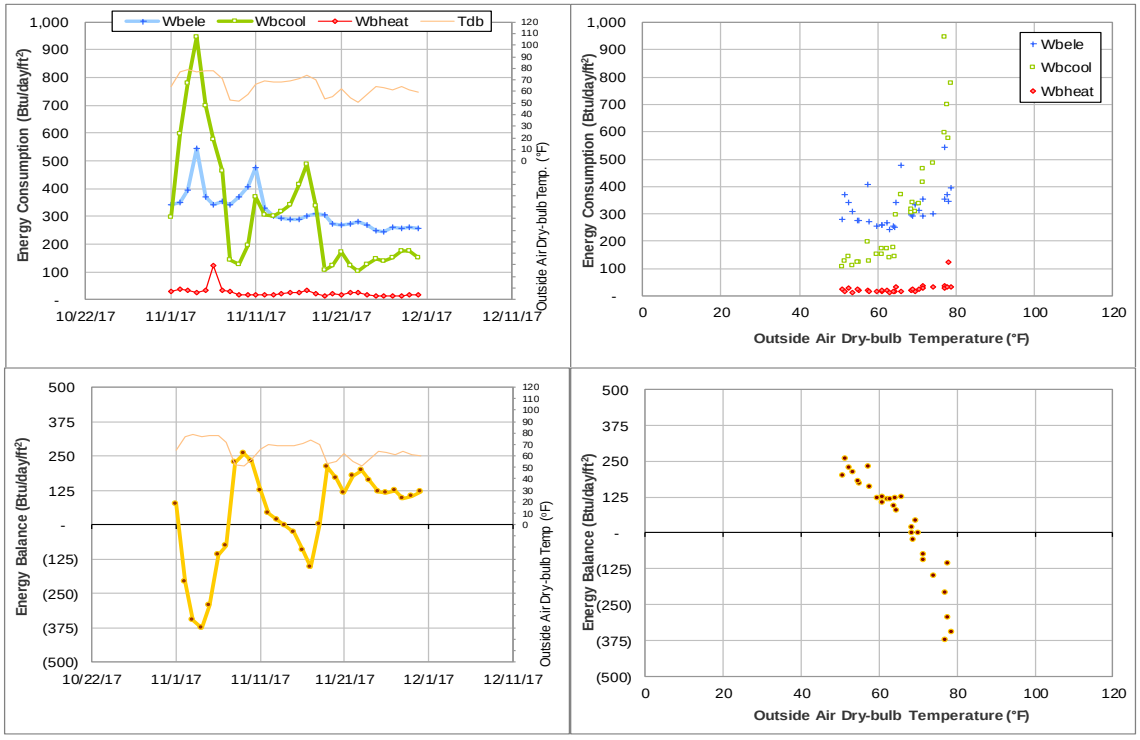


Figure V-2 Kyle Field TAMU BLDG # 367 Energy Balance Plot during November 2017

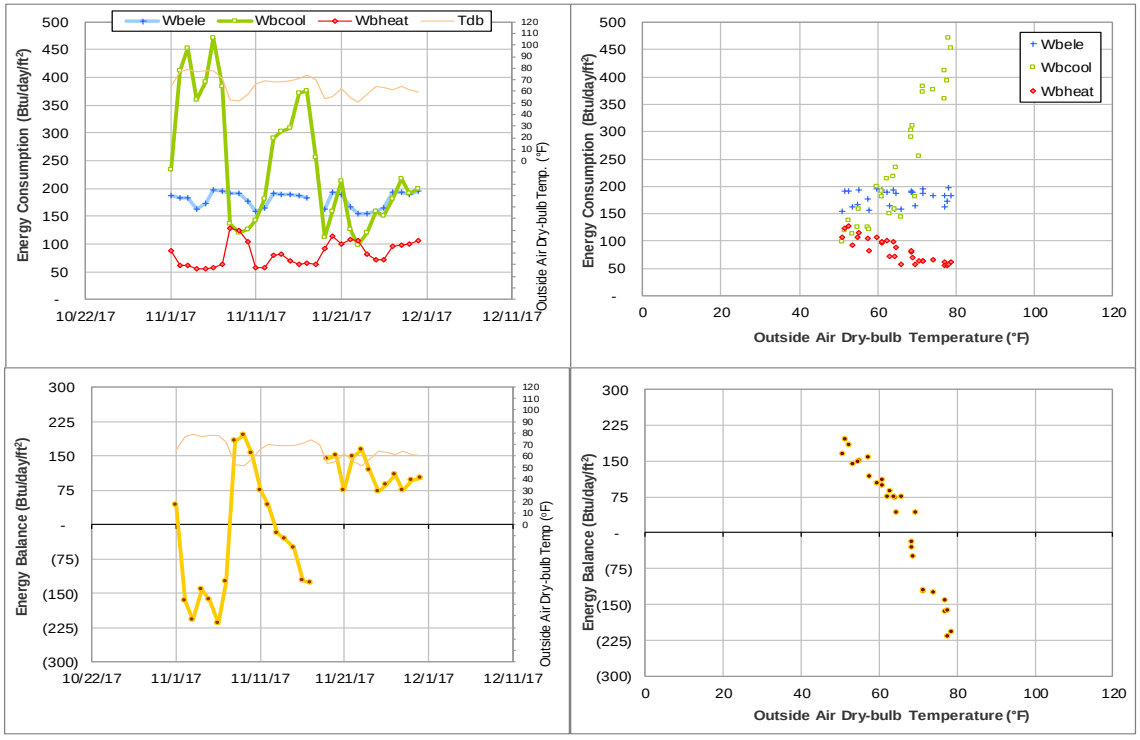


Figure V-3 Richardson Petroleum Engineering Building TAMU BLDG # 387 Energy Balance Plot during November 2017

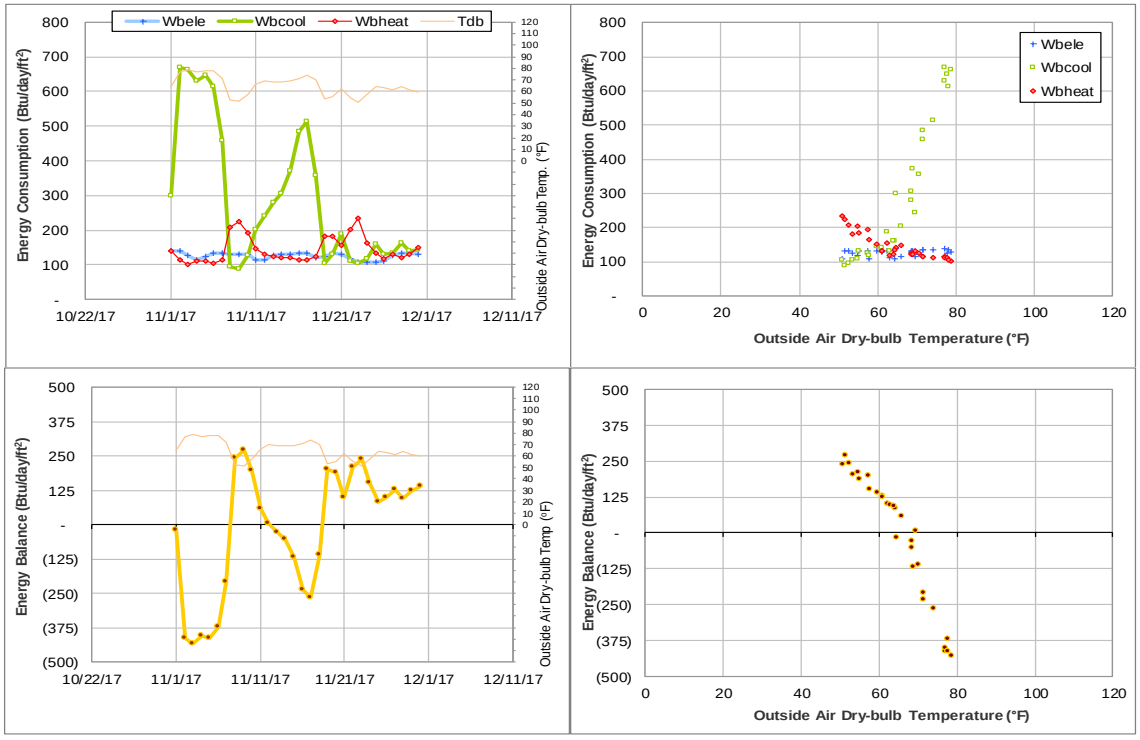


Figure V-4 Reed-McDonald and Engineering Innovation Center TAMU BLDG # 436 Energy Balance Plot during November 2017

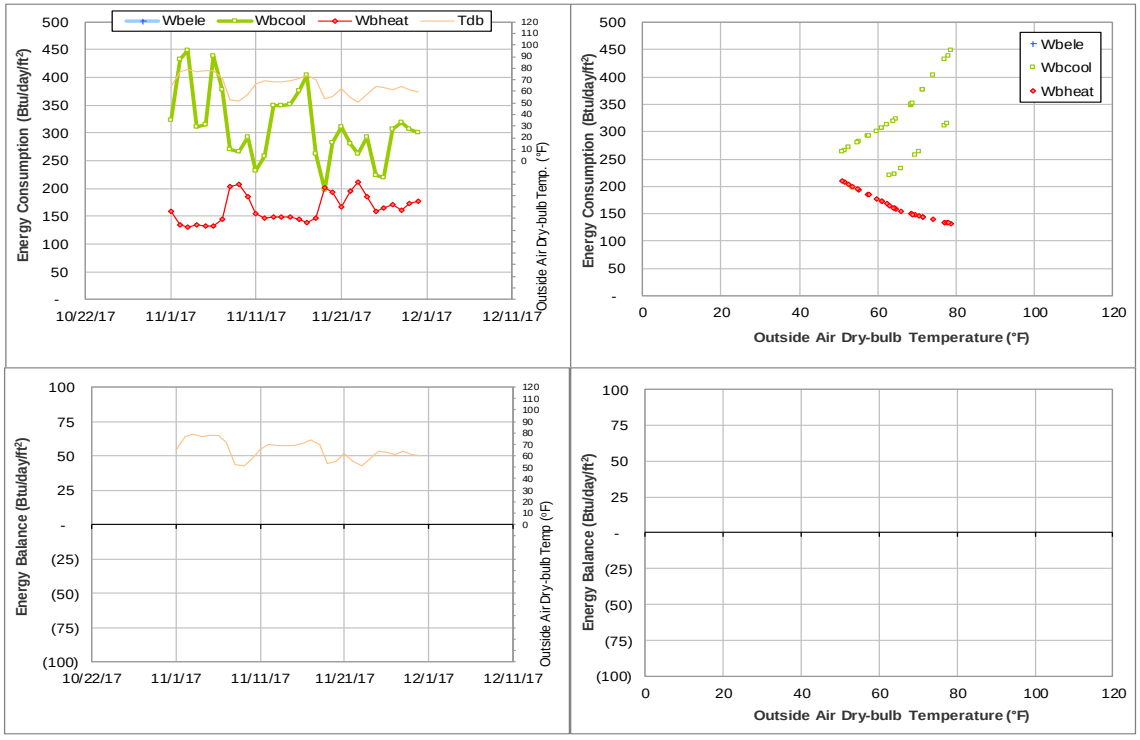


Figure V-5 Military Sciences Building TAMU BLDG # 456 Energy Balance Plot during November 2017

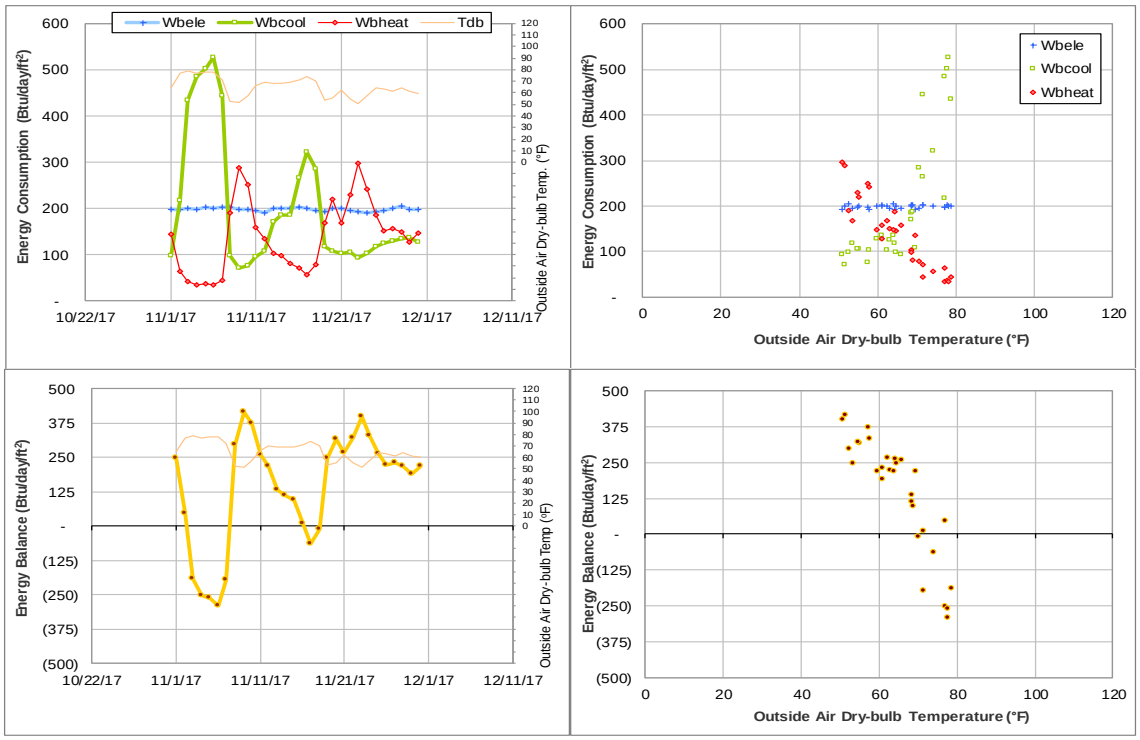


Figure V-6 Central Campus Parking Garage TAMU BLDG # 469 Energy Balance Plot during November 2017

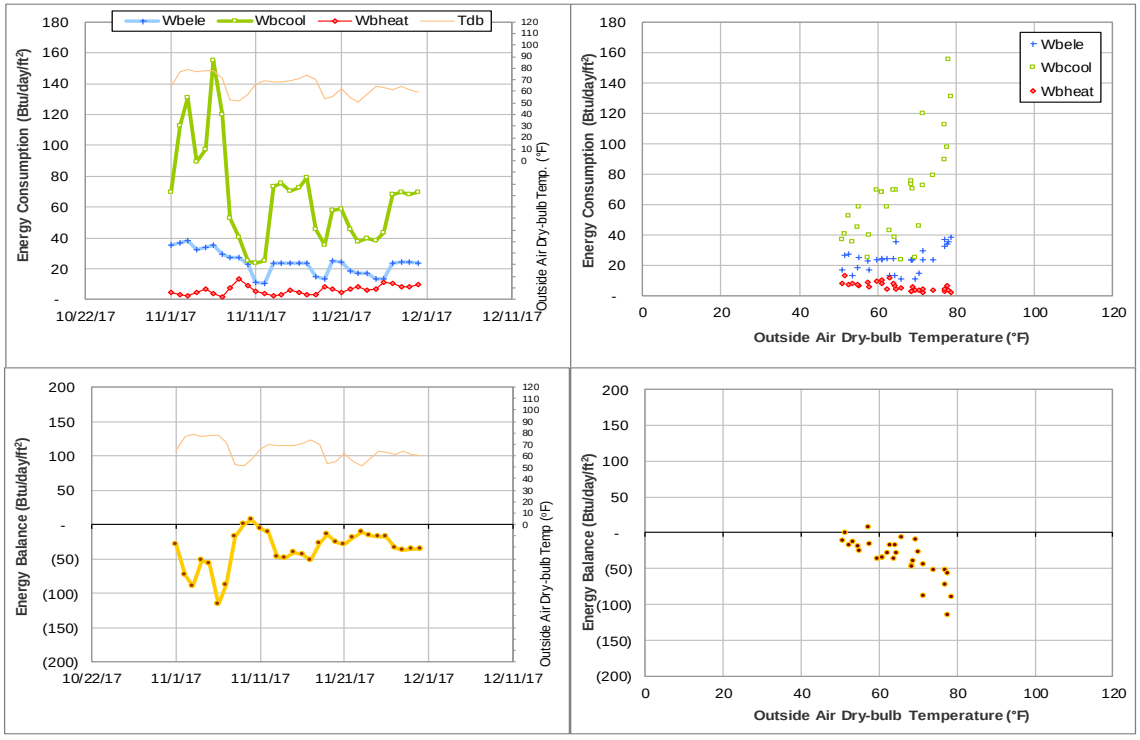


Figure V-7 Utilities & Energy Services Central Office TAMU BLDG # 496 Energy Balance Plot during November 2017

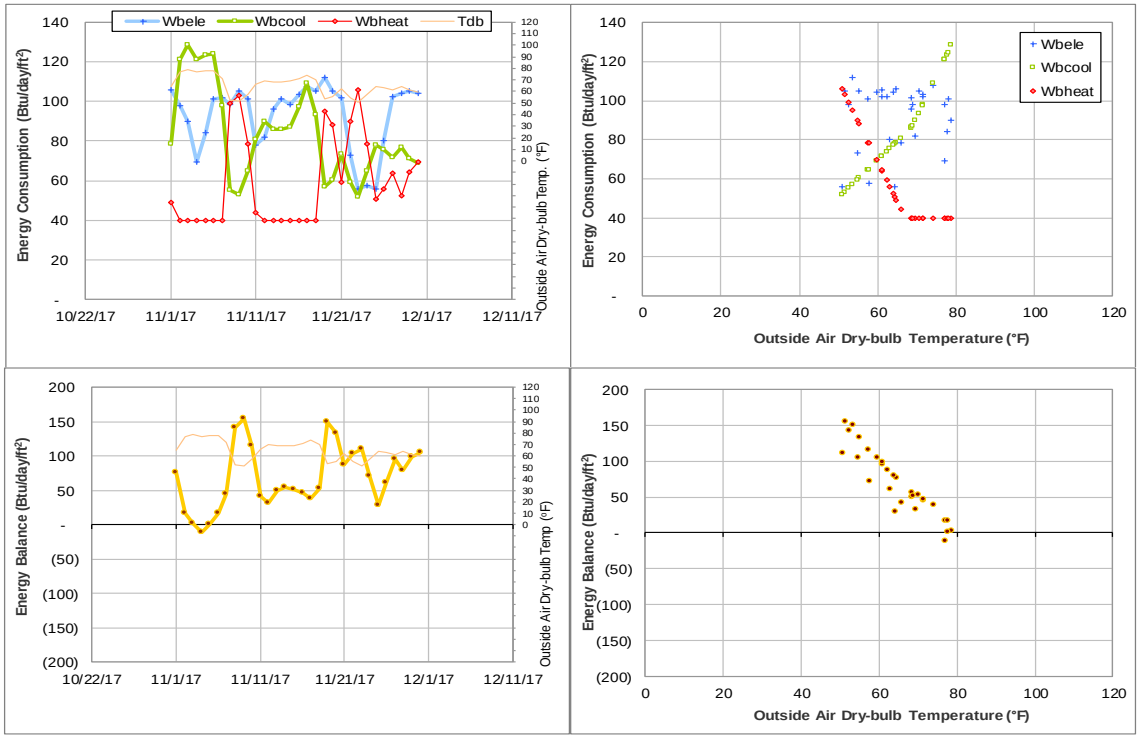


Figure V-8 Engineering Innovation Center TAMU BLDG # 499 Energy Balance Plot during November 2017

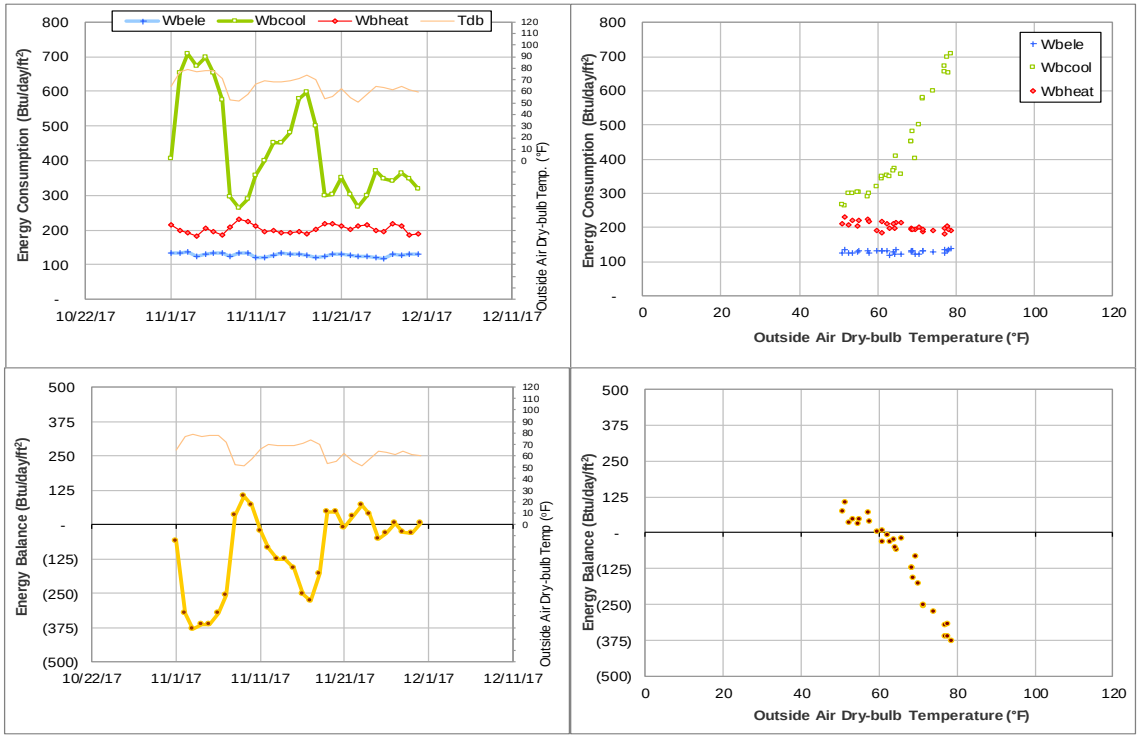


Figure V-9 Veterinary Medical Science Building TAMU BLDG # 507 Energy Balance Plot during November 2017

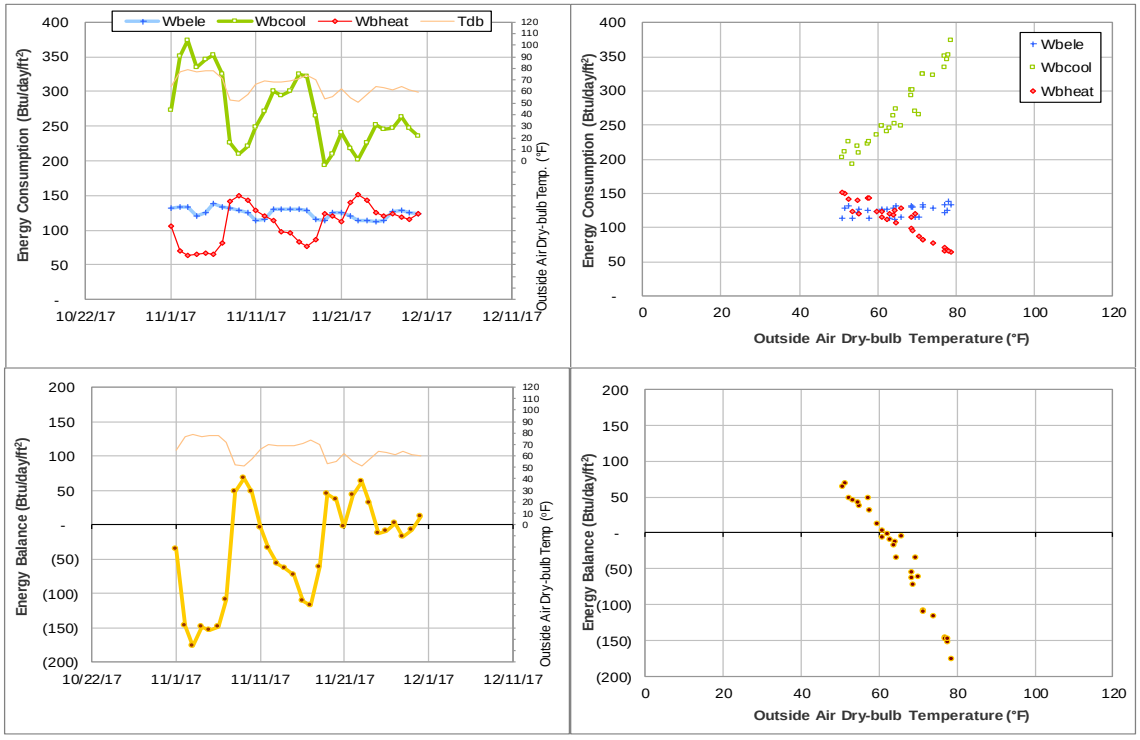


Figure V-10 Veterinary Teaching Hospital and Med Adm TAMU BLDG # 508 Energy Balance Plot during November 2017

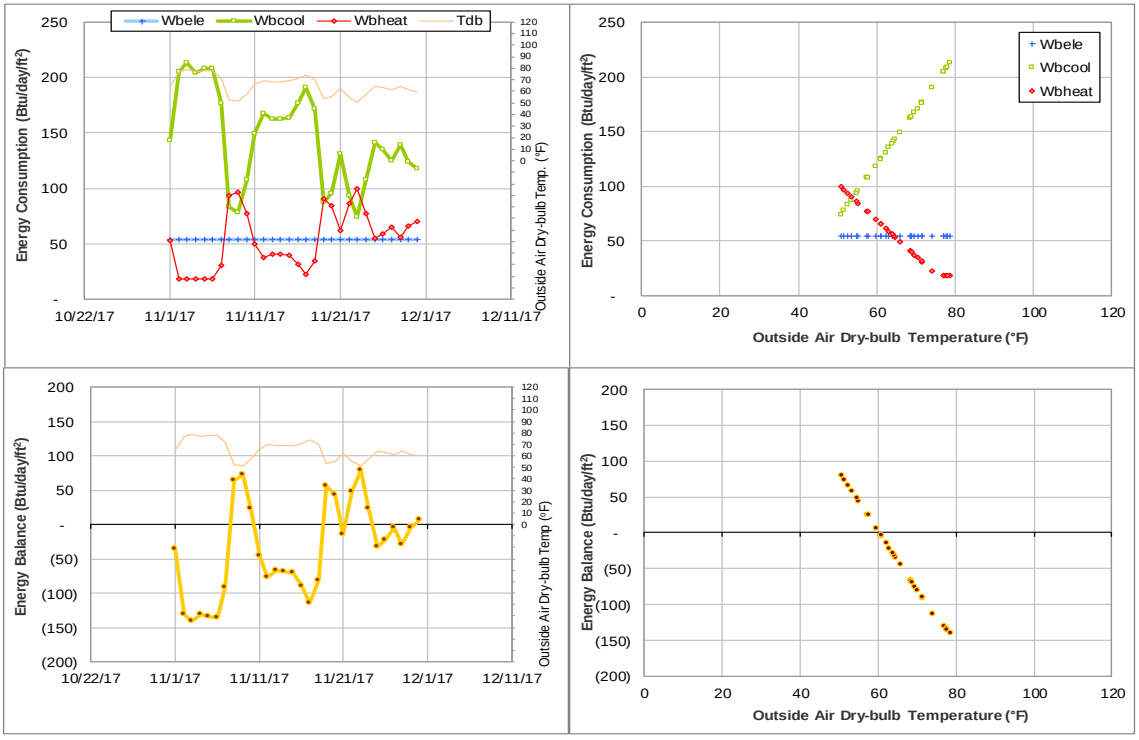


Figure V-11 Zachry Engineering Education Complex TAMU BLDG # 518 Energy Balance Plot during November 2017

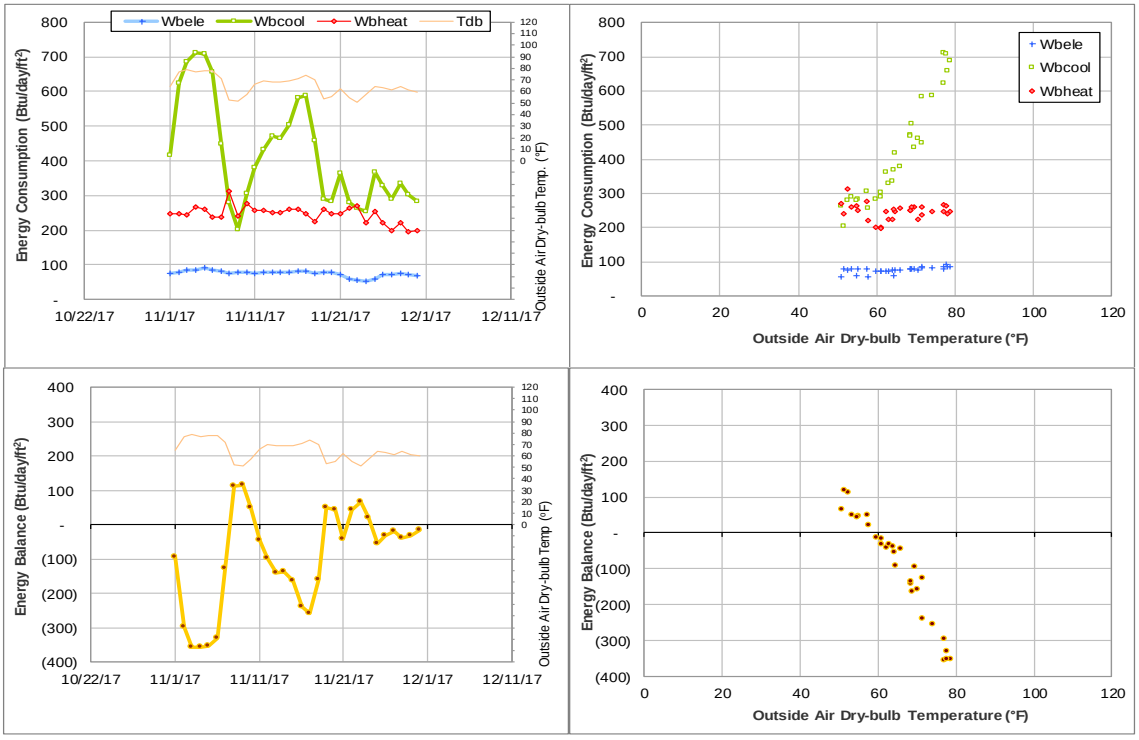


Figure V-12 Clements Residence Hall TAMU BLDG # 548 Energy Balance Plot during November 2017

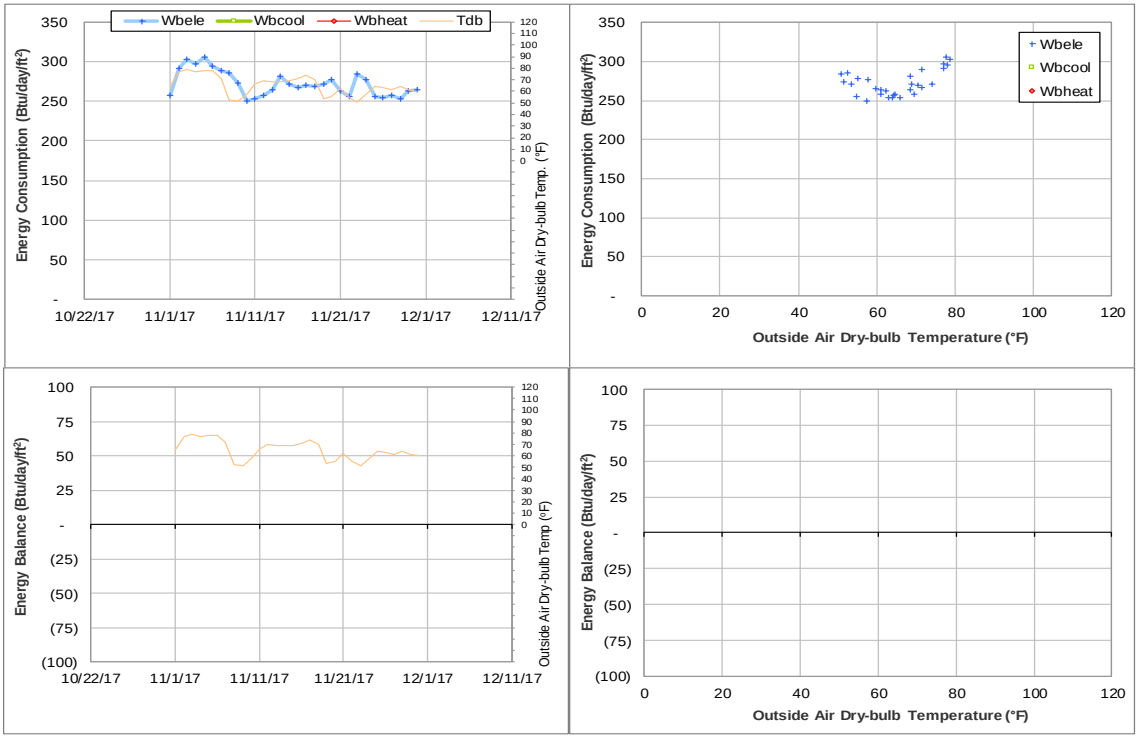


Figure V-13 Dollar Data Center TAMU BLDG # 971 Energy Balance Plot during November 2017

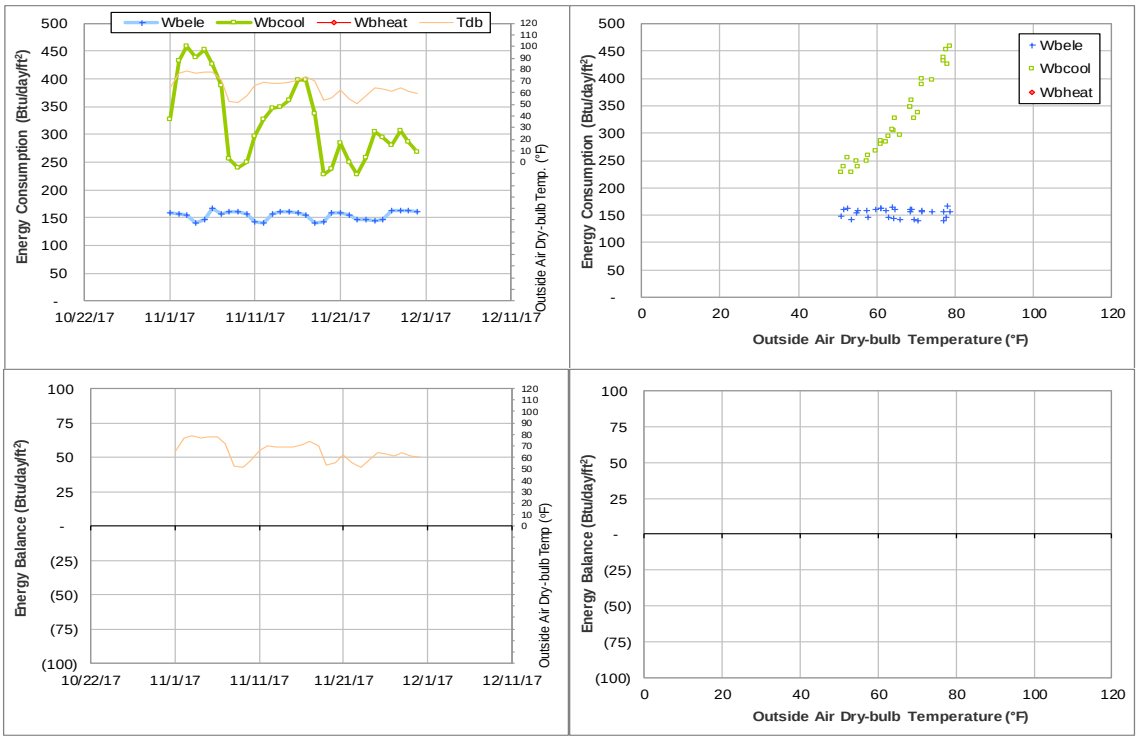


Figure V-14 Veterinary Medicine Administration TAMU BLDG # 1026 Energy Balance Plot during November 2017

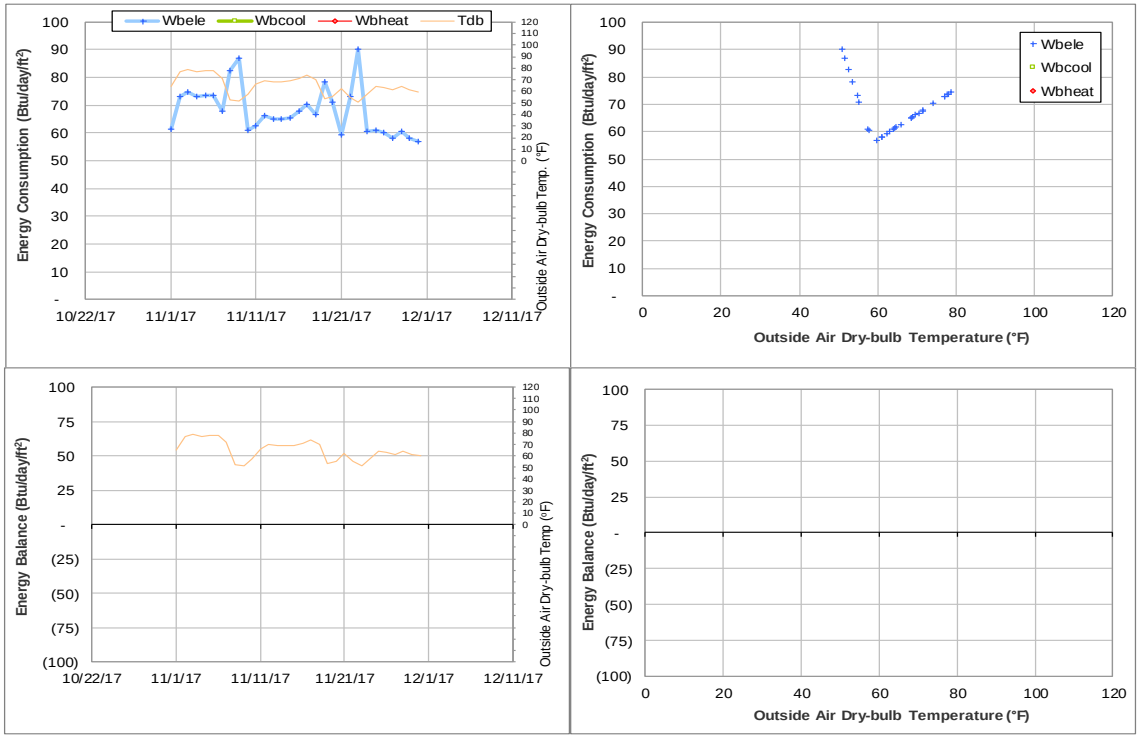


Figure V-15 University Apartments - The Gardens F TAMU BLDG # 1454 Energy Balance Plot during November 2017

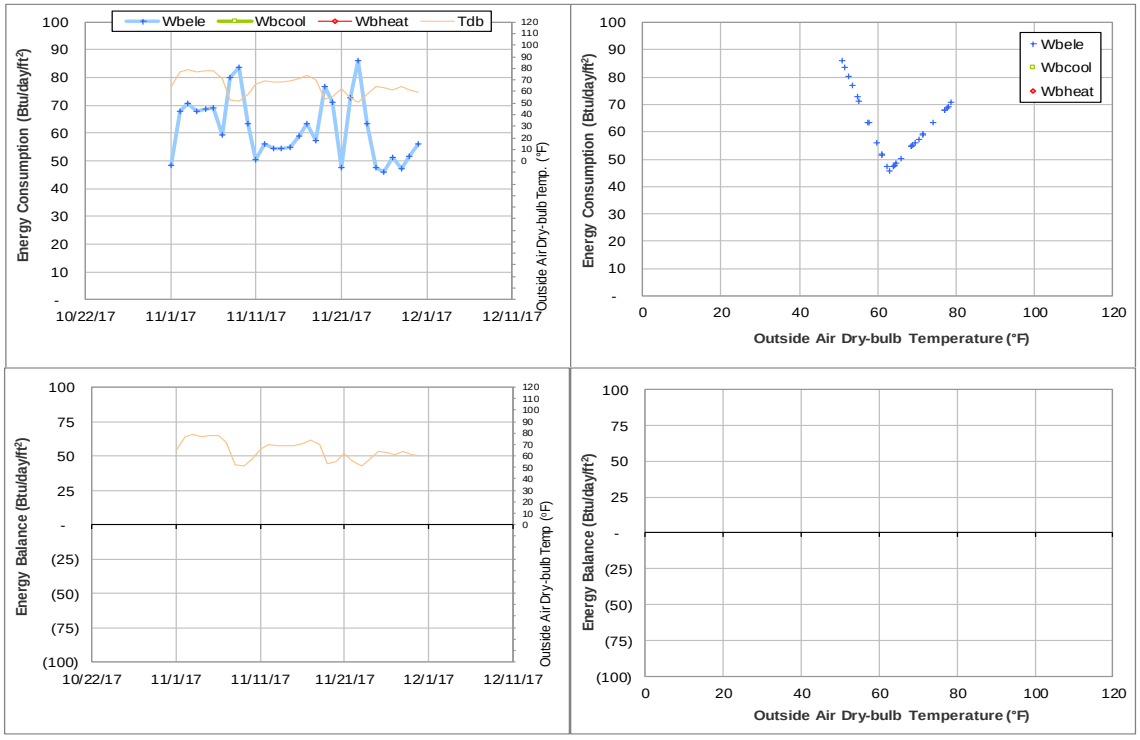


Figure V-16 University Apartments - The Gardens G TAMU BLDG # 1455 Energy Balance Plot during November 2017

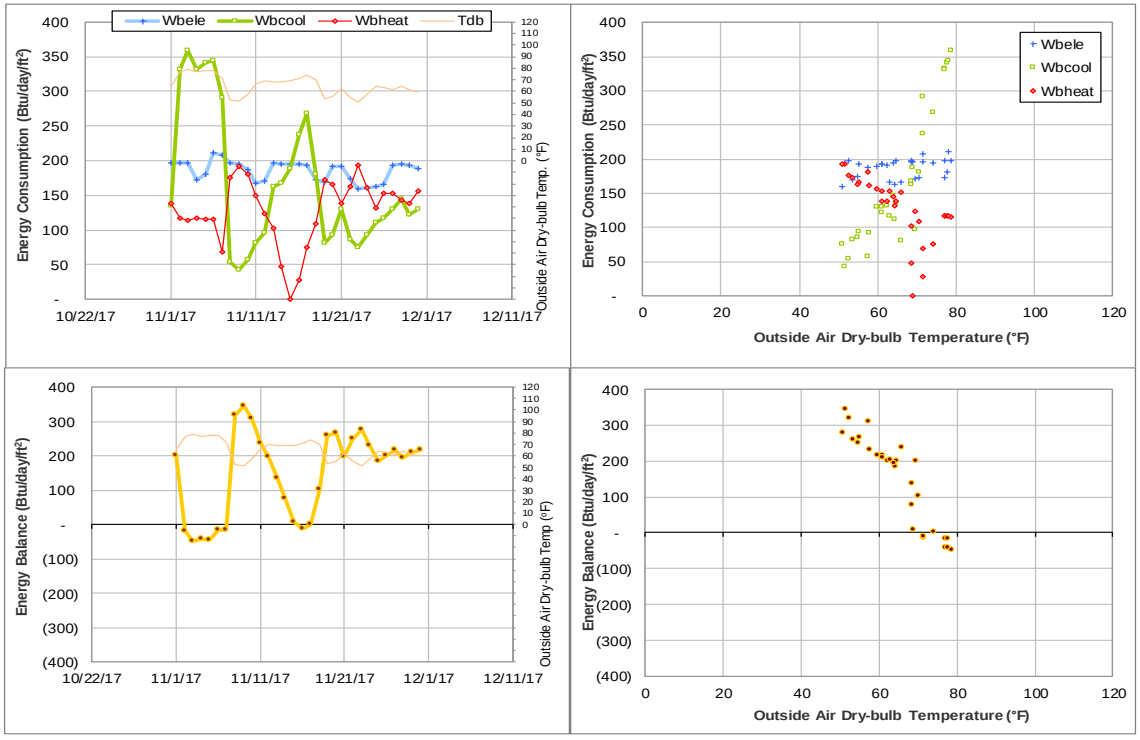


Figure V-17 Kleberg Center TAMU BLDG # 1501 Energy Balance Plot during November 2017

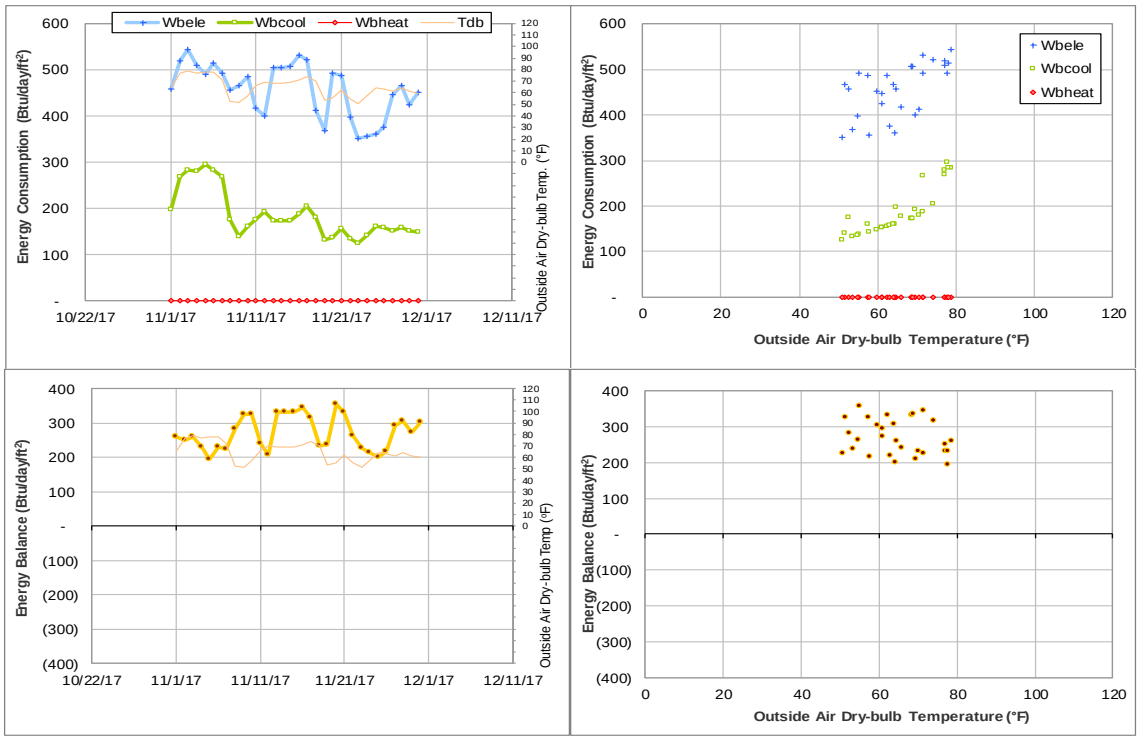


Figure V-18 Rosenthal Meat Science & Technology Center TAMU BLDG # 1505 Energy Balance Plot during November 2017

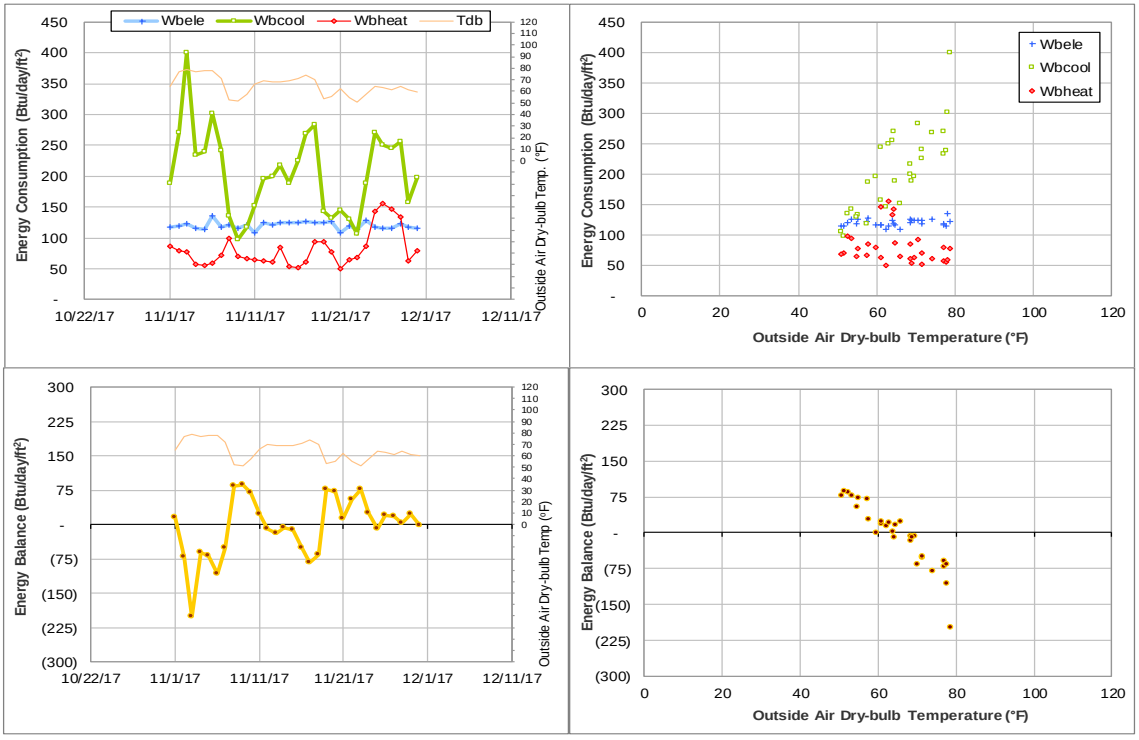


Figure V-19 Reed Arena and Cox-McFerrin Center TAMU BLDG # 1554 Energy Balance Plot during November 2017

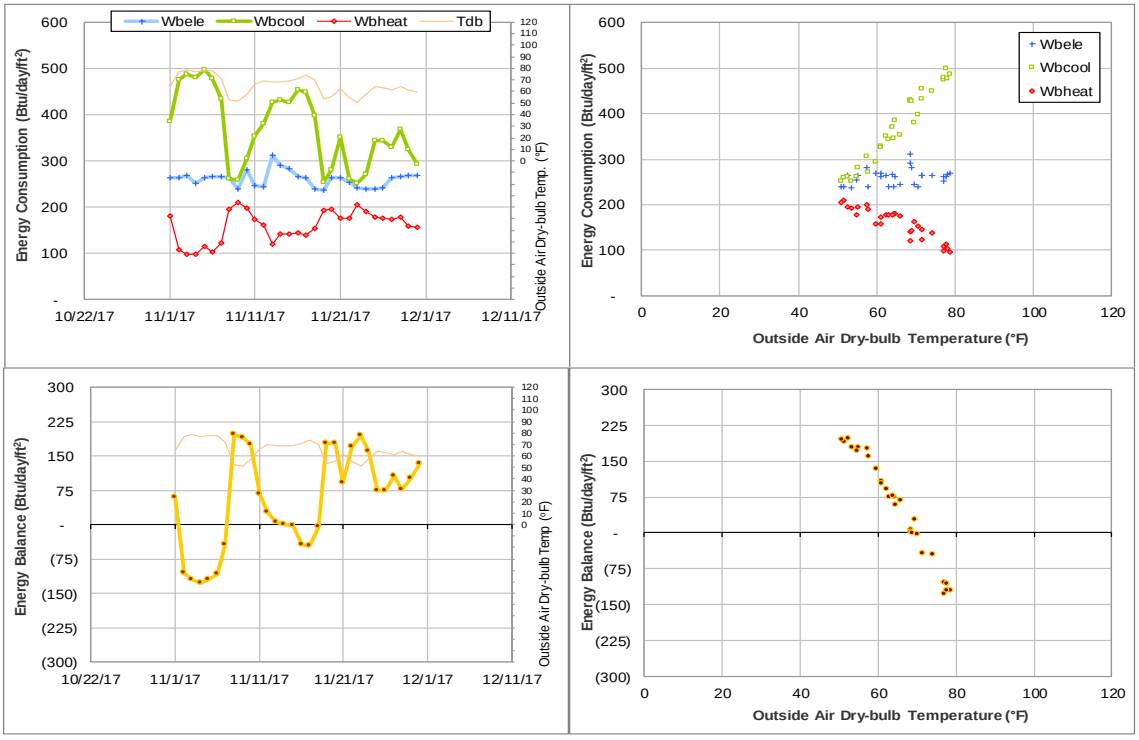


Figure V-20 Offshore Technology Research Center TAMU BLDG # 1604 Energy Balance Plot during November 2017

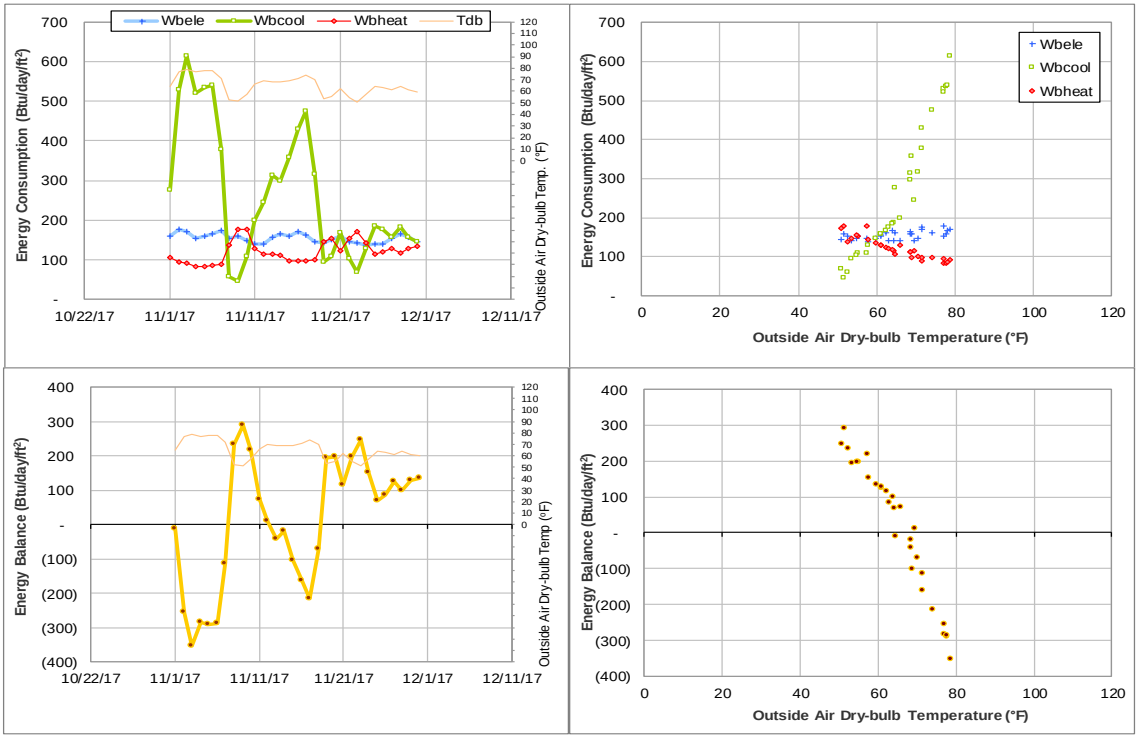


Figure V-21 Texas A&M Institute for Preclinical Studies A TAMU BLDG # 1904 Energy Balance Plot during November 2017

VI. Appendix

ENERGY ANALYSIS GROUP

ENERGY SYSTEMS LABORATORY
TEXAS A&M ENGINEERING EXPERIMENT STATION

Project: TAMU Energy Consumption QC/QA Analysis*

Report: Energy Consumption Data Quality Assurance/Quality Control Assessment Report for the Month of November 2017

Prepared for:

Utility & Energy Services

Division of Administration

Texas A&M University

Authors: Xiaoli Li, Kimberly Jones, Hongxiang Fu

Dr. Juan-Carlos Baltazar, and Dr. David Claridge

Date: December 2017

* For information on this report please contact Dr. Juan-Carlos Baltazar.